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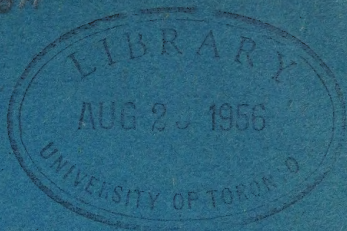
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CANADA AGRICULTURE AND  
COLONIZATION, SELECT STANDING  
COMMITTEE ON

# REPORT

OF THE

1874



SELECT STANDING COMMITTEE

ON

AGRICULTURE AND COLONIZATION

FIFTH SESSION, EIGHTH PARLIAMENT

1900

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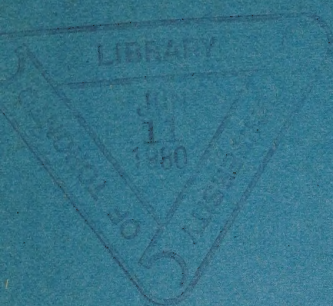


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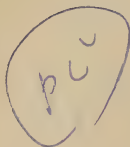












# REPORT

OF THE

SELECT STANDING COMMITTEE

ON

## AGRICULTURE AND COLONIZATION

FIFTH SESSION, EIGHTH PARLIAMENT

1900

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## THE COMMITTEE.

(JOHN McMILLAN, ESQ., *Chairman.*)

Messieurs :

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Bell (*Addington*),  
Bell (*Pictou*),  
Bergeron,  
Bernier,  
Blanchard,  
Bostock,  
Bourassa,  
Bourbonnais,  
Broder,  
Burnett,  
Calvert,  
Campbell,  
Cargill,  
Carscallen,  
Casey,  
Christie,  
Clancy,  
Cochrane,  
Comstock,  
Davin,  
Déchêne,  
Demers,  
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Gauthier,  
Gibson,  
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Mackie,  
MacLaren,  
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McIntosh,  
McLennan (*Glengarry*),  
McLennan (*Inverness*),  
McMillan,  
McMullen,  
McNeill,  
Marcil,  
Marcotte,  
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Stenson,  
Stubbs,  
Sutherland,  
Talbot,  
Taylor,  
Tolmie,  
Tucker,  
Turcot,  
Tyrwhitt,  
Wilson.



## REPORT.

The Select Standing Committee on Agriculture and Colonization present their Fifth and Final Report as follows :—

The investigations of the Committee during the current Session of Parliament, included the following subjects : *First*,—Agriculture in its different aspects throughout the Dominion of Canada ; *Second*,—The preservation of Timber and Forestry in Western Canada ; *Third*,—Immigration, coupled with the settlement upon homesteads in Western Canada ; *Fourth*,—The Beet Root Sugar industry in reference to Canada ; *Fifth*,—The treatment of Tuberculosis in animals.

Under the head of Agriculture the following witnesses were examined : Dr. William Saunders, Director of Experimental Farms ; Dr. James Fletcher, Entomologist and Botanist ; Mr. A. G. Gilbert, Manager Poultry Branch ; Mr. Frank T. Shutt, Chief Chemist ; Mr. J. H. Grisdale, Agriculturist ; Mr. W. T. Macoun, Horticulturist, and Professor James W. Robertson, Commissioner of Agriculture and Dairying.

Under the head of Timber and Forestry, evidence was furnished by Mr. Elihu Stewart, Chief Inspector of Timber and Forestry for the Dominion.

Under the head of the Beet Root Sugar industry, the evidence was furnished mainly by Mr. G. C. McMullen, Watertown, State of New York.

On the treatment of Tuberculosis in animals, evidence was furnished by Dr. D. McEachran, Chief Veterinary Inspector for the Dominion of Canada, and by Mr. D. M. Higginson, Veterinary Surgeon.

The Committee recommend that the following evidence taken by them in the current Session, viz. : That of Professor James W. Robertson, Commissioner of Agriculture and Dairying ; that of Dr. McEachran, Chief Veterinary Inspector, and of Mr. Higginson, Veterinary Surgeon, be printed forthwith for prompt distribution as follows : Twenty thousand (20,000) copies of each in separate and pamphlet form, in the usual proportions of English and French, to be distributed as follows : Fifteen thousand (15,000) copies of each to be distributed to Members of Parliament ; Four thousand nine hundred (4,900) copies for distribution by the Department of Agriculture ; and One hundred (100) copies for the use of the Committee.

All of the evidence above referred to and taken under the several heads enumerated is hereby submitted as an essential portion of this Report, including the evidence on immigration and settlement already reported to the House, and it is hereby recommended that this entire report so consolidated may be printed and issued for circulation, in the usual volume form, forthwith.

All of which is respectfully submitted.

JOHN McMILLAN,  
*Chairman.*

House of Commons,  
4th July, 1900.





THE EVIDENCE

PART I

INCLUDING

AGRICULTURE AND DAIRYING

IN

CANADA



## INSECT PESTS, GRASSES AND WEEDS.

COMMITTEE ROOM 46,

HOUSE OF COMMONS.

Thursday, March 1, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock, a.m., Mr. McMillan, Chairman, presiding.

Dr. JAMES FLETCHER, Entomologist and Botanist of the Dominion Experimental Farms, was present by request and made the following statement:—

Mr. CHAIRMAN AND GENTLEMEN,—One of the pleasant events of my year's work is the opportunity of meeting the members of the Select Standing Committee on Agriculture and Colonization. Not only is it pleasant but it is of very great value to me in carrying out the work of my department, because it brings me directly into contact with the representatives of the people from all parts of the country whom I have to serve officially. In my work it is a great benefit to learn promptly of the outbreaks of noxious insects and injurious weeds. This I do frequently through the good offices of gentlemen of this committee, and I am thus able to be of service to many who would not themselves have thought of applying for information and assistance, until the pests had made so much headway that remedial measures were too late, or at least much less effective than they might be. In no class of work is the value of prompt and definite advice of more service, than the subjects which have to be dealt with by the practical entomologist and botanist, where it frequently happens that much money may be saved by knowing what are the best steps to be taken on sudden and unexpected appearances, in large numbers, of some new agricultural pest.

As is naturally the case after many years' devotion to the study of these subjects, there is a large amount of accumulated knowledge recorded in the division, both from our own experience and from that of our many correspondents all over the Dominion, which can be utilized at short notice, to the advantage of applicants who may never previously have suffered from certain crop pests, which, although they may break out occasionally as serious enemies in certain localities, are not of regular occurrence, and, therefore, are not generally known by farmers. It is the duty of the officers of the Division of Entomology and Botany to be acquainted with these, or with the general principles founded upon their habits, by which they can advise promptly what should be done to avoid loss.

There is nothing very new in the development of the practical study of insects or plants during the last year, not already touched on or treated of in the reports of previous years; but every year there is an advance in our knowledge, not only from the accumulation of facts, as to the habits of insects and plants, but in the application of this knowledge for controlling pests. There is, I think, no branch of study in the science of agriculture towards which more attention has been directed of late years, or with more important results, than economic entomology. The practical investigation of the lives of insects which injure products of the farm, orchard and garden, with the object of discovering the best, cheapest and easiest, effective remedies.



## ERADICATION OF THE SAN JOSE SCALE.

With your permission, Mr. Chairman, I will refer briefly to some of the subjects of greater interest which have been brought officially under the notice of the division since I last had the honour of addressing the committee. Of these not one perhaps was of greater interest to every fruit grower than the work of the Ontario Government in trying to control the San José scale, an extremely injurious insect which attacks almost all kinds of deciduous fruit trees and ornamental shrubs, and with regard to which I addressed the committee at some length last year.

*By Mr. Wilson :*

Q. Has any other province been bothered except Ontario ?

A. Well, no sir, not bothered; but the scale occurred in British Columbia in two districts; steps were however promptly taken by the Government inspector of fruit pests, and it was wiped out entirely.

Q. By the local or Dominion Government ?

A. By the local government. It occurred only in a few isolated places, and the trees were at once cut down when it was discovered, which stopped the infestation. In Ontario it was a much more serious matter, because before its discovery it had already made considerable headway and there was naturally a great objection on the part of the fruit growers who did not understand the serious nature of the introduction, to have their trees destroyed, or even to go to any great expense in treating them. In one or two districts the insect obtained a foothold and spread rapidly, the fruit growers throughout the country could not be made to understand what a serious infestation this is, and consequently strenuous enough efforts were not made at first to control the scale, which is, as has often been stated, by far the most difficult insect enemy we have ever had to combat. However, after three years' experience the fruit growers of Ontario have learned its true nature, and the very men who at first maintained that the danger from this pest was unduly magnified by entomologists, and that for this reason no Act should have been passed by the Ontario Government to control it any more than many other insects found in orchards, now claim that the insect is so firmly established that it can never be eradicated, and therefore the government should treat infested trees instead of insisting on their total destruction. It was known at first that it was going to be a hard, long fight to control this scale insect, and that any measures adopted would have to be kept up continuously, if any good results were to be obtained. The Ontario Government was hampered by public opinion, from the beginning, and finally during the past summer had to relax their wise efforts in behalf of the fruit growers and give up the plan which they had at first adopted of destroying all trees found to be infested by the San José scale.

I have recently read in the newspapers that the provincial Minister of Agriculture is now going to allow fruit growers to treat their trees instead of having them destroyed by the government. This is in response to widely expressed opinion that the fruit growers do not wish him to persist in carrying out the drastic measures which he had adopted for the eradication of the scale—measures which I believe, from all we know of the nature of this enemy, were the proper ones for him to have adopted if control of the insect was to be secured—but governments, of course, are not like ordinary individuals; they merely represent the people and have to bow to public opinion when this is found to be the will of the majority concerned.

Q. These measures were to destroy the trees ?

A. Yes, the destruction of all infested trees. I think if that step had been taken at first and had been adhered to strictly, this insect could not have spread because it was not widely established, and the Federal Government soon passed the San José Scale Act, of 1898, which has been stringently enforced. Therefore, no new infestation was possible, and, though statements are made to the contrary, I do not believe there has been any fresh introduction of the scale on infested nursery stock from the United States. Of course, there are always some people

## APPENDIX No. 1

who will risk the penalty and break any law; but there has been very little smuggling in this connection. That is a general statement which I believe to be accurate. Both the Federal and the Provincial San José Scale Acts have had some opponents from the beginning, but it was a matter which the Governments had to consider for themselves, and they did what they thought wisest, after considering the matter as carefully as possible. After this it is probable that some measures will be adopted in Ontario by which fruit growers will be allowed to treat their trees themselves, and every one will then have to take his chance as to what losses he may suffer from this justly dreaded insect.

*By Mr. Sproule:*

Q. By spraying?

A. Yes, chiefly by spraying, also by fumigation with hydrocyanic acid gas or by treatment of the trees with crude petroleum, which is claimed to be a sure remedy. Unfortunately many of the remedies which have been claimed to be specifics which would surely effect the object of destroying this pest, have not proved to be so when tested. First, there was the ordinary kerosene emulsion, made from coal oil and soap suds, which it was claimed would destroy the San José scale, and it will if put right on every insect, but this insect is so exceedingly minute and it quickly covers the trees so extensively that it is difficult to treat trees thoroughly. What is necessary is a practical remedy, that is, one which will accomplish what is claimed for it, and which can be applied easily and at a cost which will not exceed a reasonable value of the tree to be saved.

Now, with regard to the danger from the San José scale, I have often said, and still maintain, that this is the most difficult insect we have ever had to contend against. It is extremely small, and when in small numbers most difficult to detect, and even when occurring in large numbers, a general appearance of grayness on the bark is the only indication of its presence, to those who are not acquainted with it, and it is thus easily overlooked. The scale must be present in very large numbers to thoroughly change, or even to a slight degree, the colour of the whole tree. Again, it breeds very rapidly, so that from a single fertile female there may be born in one season the incredible number of three thousand millions. This marvellous power of increase, and its inconspicuous nature, render it a task of the greatest difficulty to control it, because if a fruit grower who finds his orchard infested hesitates for only a short time as to whether he will treat his trees or destroy them outright, the insect may spread to other trees or other orchards adjoining his own. In the United States the San José Scale has spread with great rapidity during the last two years. This was largely owing to the Spanish-American war, during which many matters of only domestic interest were left in abeyance till that, as it was thought, much larger issue was disposed of. In many states this resulted in drawing off attention from proposed legislation looking to the control or eradication of the San José scale. Many states now find that the insect has spread very much indeed, among their orchards, and they now have to do what the Ontario Government is going to do, namely, allow fruit growers to treat infested trees, in short, to make the best of a bad job. In some states the fruit growers say that treatment by the legislature is not practicable owing to the extent to which the scale has spread. This, what is claimed by many, is also the case in Ontario. They say that the pest is now, so firmly established that it would be such an enormous expense to treat it, or to destroy the trees, that it would be unjustifiable; now however, as the fruit growers themselves are responsible for this state of affairs, having taken the matter into their own hands, they must accept the consequences, whatever these may be. First of all they persisted in buying nursery stock from states which were known to be infested, then tried to belittle the danger of allowing this insect to be introduced and finally have insisted on the Provincial Government relinquishing its efforts to control it and save them and the country from loss. It seems hard, however, that those who tried strenuously to do what was best and right in controlling this pest, should have to suffer from the ignorance, supineness, or carelessness, call it what you will, of others, who had not suffered; but that is frequently the case.



Every effort has been made by entomologists to put before the public the best means to adopt in order to subdue and control this insect, and we have endeavoured to make known what an exceedingly dangerous insect it is. Nothing we have learned about it up to the latest moments justifies us in considering it other than a most dangerous and much to be dreaded enemy.

*By Mr. Clancy :*

Q. Is it not a fact that trees in the forest generally are infested as well as fruit trees?

A. No, certainly not in Canada.

Q. Well it is broadly stated that basswood and some other kinds of forest trees are affected?

A. The statement that they are generally affected is entirely unfounded. I have never found it or seen it in Canada on forest trees, and, even in New Jersey, the only state where it is stated to have spread to the forest trees, it has been discovered in a few localities only. It was stated two years ago that the forests in New Jersey were so badly infested that there was no chance of ever eradicating the scale. This on examination was, I am told, found not to be the case. In Ontario this is certainly not the case. Mr. George E. Fisher, the Ontario Government Inspector of San José scale, who is a very efficient officer and a conscientious worker, has carefully and frequently examined trees close to infested orchards, and up to the present has not been able to discover the pest in any instance on forest or shade trees.

Q. Who is he?

A. He is a practical fruit grower living at Freeman in the Hamilton district. He has been known for many years as an expert and successful fruit grower and I believe is now from his experience, one of the best experts we have in Canada, on the San José scale; for the last two years Mr. Fisher has studied the San José scale in Ontario's orchards with great assiduity and being also a good microscopist he has studied the insect in all its stages of development and is now undoubtedly one of the best authorities upon the subject in Canada. Mr. Fisher tells me that he has not found the scale on forest trees; still of course, if neglected, it will in time spread to them and then little can be done to check it except in orchards. It has been found to be characteristic of many imported insects that where they feed on one class of plants it generally takes them a long time to spread from that class of plants to others even where these are closely allied with the cultivated forms. Not only is this the case, but frequently an insect which feeds in one place chiefly on one kind of tree does not do so in another. As an instance of this, the two kinds of tent caterpillars which destroyed the aspen poplar groves along the Ottawa, and left them as bare as poles in June last, were found in many places in the province of Quebec to be most destructive to the sugar maple trees, while here, even when the maple trees were growing among the poplars, they were not attacked, and in most places the red maple was left untouched as long as there was anything else for them to eat. There are aberrations in the habits of all insects of this nature, which we cannot explain. The same insect in one place will feed on one tree and in the other upon quite another. The same thing applies to an insect when it is introduced into a new locality. It very seldom spreads, for some years at any rate, to any other class of trees, even although that class of trees may in another district be attacked by it. It was hoped that the information we could gather from the large amount of published accounts of the depredations of the San José scale in the United States, and the different trees attacked, would allow us safely to exempt from the list of trees usually imported from the United States, many that were useful for ornamental purposes and had not been attacked by the San José scale; but we found that almost every woody-stemmed deciduous tree and shrub was attacked, and, therefore, we had to include within the provisions of the San José Scale Act, all trees except those of the pine and orange



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families. There has been no instance recorded of this insect attacking the different members of the pine family. This however, did not, as some have thought, allow of the importation of all kinds of evergreens, because there are many kinds of evergreens which do not belong to the pine family. The question as to whether or not the San José scale had escaped from the orchards and become prevalent in our forests was one of considerable importance, because if this could have been proved, the drastic and offensive measure of destroying infested orchard trees, could have been done away with, for, if the scale were so thoroughly established in Canada that there was no hope of controlling it, there would have been no use in cutting down affected trees. But that is not the case, and more than that, this pest is still restricted to a comparatively small part of the province of Ontario; the Provincial Government has made enormous efforts to control it and has done excellent work.

## MIXTURES FOR SPRAYING,—CARE IN USING THEM REQUIRED.

The effect of the new provision allowing the spraying and treating of trees cannot be anticipated; but the study of the application of remedies and the development and improvement of the remedies themselves have gone on steadily improving, until now they are all materially changed from what they were two or three years ago. Many new materials have been recommended recently in the way of poisonous applications, mostly of arsenical applications for the destruction of foliage-eating caterpillars. Among this class of insects, the Tent Caterpillars are just now of special interest to many; these are the caterpillars already referred to, which for the last three years have been extremely abundant all through the Maritime Provinces, Ontario and Quebec and with an allied species in the Prairie Provinces and through British Columbia. Up to the present time, for various reasons, I consider this well known material, Paris green, is the best of the poisonous applications to recommend. Several poisons have been studied carefully at some of the experimental stations during the past year, and have been reported on and recommended in the bulletins of those stations. Paris green is a chemical combination of arsenic, acetic acid and copper. Green arsenite is similar without some of the ingredients of Paris green, which allows it to be produced at less expense. Then again there is arsenate of lime, gypsine, &c., &c., all of which have their advocates; some of these will probably be largely used instead of Paris green. Para green a new proprietary remedy which has been lately introduced, differs from Paris green in the absence of acetic acid, and has been found useful; it is also much cheaper than Paris green.

## DANGER FROM SUBSTITUTE POISONS.

But with all of these there is still a certain degree of uncertainty or danger. I do not myself consider it desirable as yet to substitute any article for the well known cheap and effective remedy, Paris green. It is so well known to every one, which is a great advantage in making a recommendation; it is to be obtained anywhere; it is perfectly effective; it gives warning by its green colour which at once declares its poisonous nature; and I see no reason yet to change the recommendation of Paris green for all foliage eating caterpillars or insects. As I have said, its use is now so well known that there is no difficulty in getting fruit growers to purchase and use it; there is very little danger of it being mistaken for other substances, and as a consequence I find that during the past few years there have been very few accidents from people mistaking it for other things, such as the various food products. If we were to allow the substitution for this of some other material not as well known, and of a white colour, such as white arsenic, there would be for a long time danger of many serious accidents. We can never hope for the large number of fruit growers and farmers who use insecticides, for that degree of necessary care which everybody

who uses poison should take. I am convinced that any white material such as white arsenic, would be far too dangerous to recommend for wholesale application, and as we have such a cheap and effective remedy as Paris green, for the present at any rate, I recommend it for general use. Undoubtedly even Paris green is used in much greater strength than is usually necessary; or than it is safe to apply to the foliage of many trees. One pound with one pound of fresh lime in 200 gallons of water, is all that is necessary for most insects, if used when they are small.

#### THE TENT CATERPILLAR,—WHEN AND HOW TO TREAT IT.

*By Mr. Clancy:*

Q. Will that kill the tent caterpillars?

A. Yes, when they are small; but unfortunately most people do not notice them when they are small. It is only those who know their habits that are on the lookout for them at the proper time, when they first hatch. The tent caterpillars hatch from eggs in the last week of April. The eggs are laid in July, and within a month the young caterpillars are fully formed inside the eggs, although they do not emerge from the eggs until the following spring. The warm weather of spring revives them when they eat their way out of the shells and attack the buds as soon as they burst.

*By Mr. Macdonald, (Huron):*

Q. What is the proper strength to kill the potato bug?

A. The potato with its coarse leaves is able to resist injury better than some other plants, and one pound in a hundred gallons of water is not too strong. If an equal quantity, or better, if double the quantity of fresh lime is put in the water this neutralizes the arsenious acid and reduces very much the danger of burning the leaves without lessening its poisonous properties. I always now recommend that an equal or double the quantity of fresh lime should be used with Paris green and then there is little danger in using it on all foliage. When the young tent caterpillars first hatch they are much more easily destroyed than when they become larger; but usually people do not notice them till they are larger and then they are not so easily destroyed. This is the reason that you hear people say that Paris green will not kill the tent caterpillar. It will however; but if the caterpillars are allowed to grow to half their full size they are much harder to kill, and in order to make the mixture strong enough to kill the caterpillar, you run the danger of killing the foliage also. The use of lime in the proportion of one or two pounds to a hundred gallons of water prevents injury to the foliage. Last season the tent caterpillars were very bad in many districts, and, in some cases, whole districts were overrun. In the Quebec province their attacks on the sugar maple-groves have given rise to much anxiety, and many letters have lately been received asking if sugar bushes which were stripped of their leaves last year can be used for tapping this season. I judge that the ravages were more serious among the sugar-maples than upon any other trees, except perhaps apple-trees in orchards. The tent caterpillar is not really a very hard enemy to fight and there is no reason at all for those who grow fruit trees in orchards, allowing them to be destroyed by this pest. Last year I was in many of the infested districts and I saw many careful fruit growers who saved their trees by strict attention to spraying at the proper time. Moreover, this same strict attention to spraying paid them very well indeed in the returns they got from their orchards. The labour and first expense of spraying should not be considered at all; what a fruit grower should consider is the question, whether the cost is commensurate with the proportion of profits. Some remedies pay better than others, and that remedy which pays us best is the one we should adopt. When a remedy is recommended I am frequently told that it costs too much. That is a very mistaken idea, for nothing costs too much if you make money out of it. Few in this country farm for amusement; most want to make money out of it. No matter how much a remedy may cost, it pays to use



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it if it gives a satisfactory margin of profit. I do not mean by margin just a bare profit, but good results. It certainly paid those fruit growers I have referred to, to spray last year, for they not only kept their orchards free from insects but got from the operation better apples and better prices than their neighbours.

*By Mr. Cochrane*

Q. What time do you recommend spraying for the tent caterpillar?

A. You cannot recommend any special date for every year, but when the tent caterpillar is abundant, as abundant as it was last year, I would spray as soon as the young caterpillars are seen on the trees; about the beginning of May would be probably as near to a general date as could be given; at any rate before the flowers open.

Q. As soon as the leaves are out?

A. Yes, just as soon as the leaves begin to expand. About the 15th to the 20th of May may be taken as an average for the appearance of blossoms, when spraying must stop for a time. I say 'spray before the flowers open, because the bees are of great benefit to fruit trees by fertilizing the flowers, and bees will be certainly killed if the spraying is done when the trees are in blossom.' The question was brought up by the Pomological Society of Quebec at its recent meeting last winter, whether they could not get a provincial Act like that in force in Ontario to prevent spraying while trees are in blossom for the protection of the bees and the fruit growers, because it has been proved that bees are certainly killed by poisons applied after the flowers open. There is no insect we know of for which the trees actually require to be sprayed during the time the trees are in blossom. Paris green is caustic and falling on the pistil—the only part of the flower where there is no epidermis—proves very injurious. Spraying with Paris green therefore when the trees are in blossom is harmful to the blossoms from the liquid falling on the viscid stigmatic disk of the pistil. This is the central portion of the apple flower and is very delicate.

#### REMEDIES FOR TENT CATERPILLARS.

The general remedies for tent caterpillars are, first, the collection of the eggs in the winter—of course I speak now of orchard practice. There is no practical remedy for the trees in forests where you could not get at the eggs laid high up on large trees, but in orchards, in the case of most fruit growers, the collection of the eggs during the winter when the trees are being pruned is a remedy of great practical use. All these insects have definite habits, and when you know these you know, in many instances, how to fight them to the greatest advantage. The rings of eggs from which the tent caterpillars hatch contain about 200 eggs and will be found a few inches from the ends of the small twigs. After finding half a dozen nests or so any one will learn to recognize them easily, and at a glance will be able to tell whether there are any egg clusters on a tree. Boys and children who, as a rule, have very sharp eyes will be found of great assistance in finding these eggs. I would not recommend this remedy for those who spray their trees regularly, for by spraying early all this labour is rendered unnecessary. But as there is unfortunately not one in half a dozen who does spray as a regular practice, the collection of the eggs in winter will be found very useful for most people. After the eggs are hatched, spraying with Paris green is the best remedy. If neglected they soon grow large and strip whole trees of their leaves; they then leave the trees to look for more food. When the caterpillars crawl down or drop from the trees they crawl along fences or paths and seem to be particularly fond of walking along railway tracks. This accounts for the stories of trains being stopped, which stories are quite true but it does not take much to stop a train. Trains have been occasionally stopped by weeds and insects, and for the same reason, a few tent caterpillars crawling along the rails will be enough to prevent the wheels from gripping, but the accounts of the great depth of tent caterpillars along the tracks by which trains have been stopped are



probably enormously exaggerated. I can quite understand that a comparatively small number of tent caterpillars walking close together along the rails, when crushed by the wheels, would speedily prevent a train making good progress. When these caterpillars wander they are in search of food, and that is a practical point for us to know about them. If you have taken the proper means to preserve your orchards and have kept them clear of insects, your trees are covered with foliage in good condition, so you may expect that they will come to you. Therefore you must take means to protect your trees from caterpillars which will come from outside and crawl up the trunks. Some of the simple mechanical contrivances are of great use. One of these is an inverted cone of wire netting which is placed around the tree, and when the caterpillars climb up they are kept there and do not seem to have sense enough to crawl down to the edge and crawl up the outside of the cone, but they gather together in masses beneath it. This will prevent them from getting up long enough to allow the fruit grower, who is on the look out, to destroy them. A syringe with coal oil is a good instrument for this purpose. Another plan is to use bands with some viscid material, such as a mixture of castor oil and resin. These have been used with good effect, for when the caterpillars reach this band painted on tin, cardboard or paper, they either get caught in the viscid mixture or will not crawl over it.

*By Mr. Sproule.*

Q. I saw farmers using wool with tar on it 30 and 40 years ago.

A. Yes, or what is less dangerous for the tree and is a very good method is to tie a band of cotton batting around the tree, as it stands out loosely and the caterpillars cannot crawl over it.

Q. Wool is better than cotton, as the cotton sags and is soon matted; wool is undoubtedly the best.

A. Yes, that would be better. I never saw wool used, but it would probably be better than cotton batting, which would need to be kept teased out. Every one knows these remedies, but the trouble is they do not use them, so their trees become infested and they lose a large percentage of their crop. About the time these pests are due to appear, we send out articles to the newspapers, little squibs, and the papers are glad to publish them. Still I must go back to my first statement that the damage done by injurious insects is due to the fact, not that people do not know the remedies but that they put them into operation too late or not at all. It is a prompt application that is effectual.

#### VALUE OF SPRAYING.

Occasionally we find new insect enemies, either new altogether or new in the sense that they are extending their range to the Dominion from some other country and these introduced insects are frequently the worst pests which attack gardens and farm crops. Injurious insects have now been studied sufficiently for us to prevent attack or minimize the injury, so that it may now be said that in almost all instances something may be done to reduce the loss. The operation of spraying is now so well known and adopted so generally by wise fruit growers and other farmers that it is not worth while taking up the time of the committee to-day with it. Every sensible man and every good business man now knows that for certain crops you must spray. The apple grower knows that to get clean, whole, sound fruit, he has to spray. Systematic experiments have shown that we can save 75 per cent of our apples by spraying at the proper time. In fact all fruit crops can be increased by spraying at the proper time. All these facts are now known and can be found in the reports of this committee, in the experimental farm reports, or in the spraying calendars; so, there is no excuse for any one in Canada who wants to know how to protect his crops or to cope with many pests which they may know, or even with those which they may not know; for they can get information easily, which will enable them to fight in the best way most of their insect enemies.

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The operation of spraying has of course developed within the last ten or twelve years; but it is now so well known that thousands of spraying pumps are sold in Canada every year. Every fruit grower knows that he has to attend to this operation the same as he has to pruning and to fertilizing the soil. Take for example the potato beetle. Every farmer now knows that this insect belongs to a certain class of leaf-eaters for which we have a general remedy well known to all, viz., an active poison like Paris green applied to the leaves and eaten with them. Then we have special remedies for special pests and these can be got only from one who knows them from special study; but the people of Canada are employing specialists to work these out for them and they know that these can be got by writing to us for them.

## SAN JOSE SCALE,—REMEDY FOR FUMIGATION.

*By Mr. Clancy:*

Q. Is there any remedy found to be a preventive of the San José scale, considering the difficulty of reaching it? Would you recommend Paris green?

A. Not for the San José scale which is a sucking insect. The scale insects must have some remedy applied which destroys them by direct contact with their bodies. The remedies are of two kinds: either a viscid remedy such as oils which will run all over their bodies and suffocate them by stopping their breathing pores, such as petroleum or the various emulsions of kerosene or the lately recommended crude petroleum, now considered one of the best remedies. Another method is suffocating with gas such as hydrocyanic acid gas, which terribly poisonous gas is liberated by the action of sulphuric acid on cyanide of potassium and water. Thus is generated an exceedingly poisonous gas to all animal life. When dormant plants are exposed to this gas for 45 minutes it does not injure the trees but entirely destroys the scale.

Q. That is not quite my question. What I asked was, in view of the difficulty that has been found with these applications, have such been found effectual in destroying the scale, always considering the means we have of treating them?

A. Yes. The hydrocyanic gas is perfectly effective when applied in the proper way and by specialists. It is a difficult matter, but any matter of difficulty may be overcome. In California and many other places where there have been serious visitations of these insects this gas has been applied with good results. Prof. Johnson of Maryland, who perhaps has had more experience with the gas treatment than anyone else in the United States, has had tents made by which he can cover over the whole tree. He generates the gas inside the tent and has met with perfect success, but this method is expensive and dangerous.

Q. I am asking this question for information. Can you suggest a remedy that the farmers can apply themselves?

A. No, I do not think there is any remedy that the ordinary farmer can be trusted to apply without danger to his trees or to himself. The hydrocyanic acid gas is so intensely poisonous that it cannot be recommended for general use. On a recent occasion, the rolling stock of a railway in South Africa having become thoroughly infested with bed bugs, it was decided to fumigate the cars with this poisonous gas. They closed up the cars, put in the acid and cyanide and left them shut up closely. Within an hour everything inside the cars so treated is dead. It is of course necessary to watch carefully that no one goes into these cars.

Q. I presume that application of this gas by farmers, considering the cost, would have to be abandoned?

A. I do not know that. I would not say that it would have to be abandoned, but that it cannot be adopted as yet; that is the point I think. Bisulphide of carbon is now largely used by pea merchants for killing the Pea-weevil. By knowing what has to be done and doing it, the men who are handling it gradually obtain that skill and method which enables them to do it without danger; and now the ordinary



farmer knows that if his peas are infested with weevils he simply procures a coal oil barrel, puts his infested peas in it, puts some bisulphide on the top, closes it up tightly and leaves it for two or three days and the bugs are killed. Many farmers know this, but they do not all practise it, and consequently the Pea-weevil is still very destructive. The stand I have taken about the San José scale is that we have not yet got a practical remedy which the ordinary farmer of the country can adopt.

*By Mr. Cochrane :*

Q. If that is a perfect cure, I look at it this way: supposing I had an apple tree worth so much, and this remedy is perfect. If you could apply it, the remedy would not be as expensive as it would be for me to cut down the tree?

A. No, but it would be exceedingly expensive for you and your neighbours to have an accident or to try a remedy that failed.

Q. I am not talking about that, but I understood you say that there is a remedy which is costly and would not be safe for farmers to adopt, but is safe when properly handled?

A. Yes, that is true. But everybody in the district suffers if the pest occurs there at all and spreads.

*By Mr. MacLaren :*

Q. Are there specialists who could apply it safely?

A. There are not enough specialists in Canada to do all the work. The Government of Ontario has had to allow the treatment of trees and the country may have to suffer for it. There are a great many things that have to be considered, and there are a great many difficulties that have to be overcome. The treatment of trees is not so easy as it looks, and my only reason for saying what I have said this morning is that I do not want disappointed people afterwards to say: 'You gave us a remedy for the pest, that was no good and hundreds or even thousands of trees have been destroyed by being cut out that could have been saved if treatment had been allowed.' We have done our best and pointed out the dangers.

*By Mr. Cochrane :*

Q. How far east has it got yet?

A. Not quite to Toronto.

#### TREATMENT ACCORDING TO CLASS OF INSECT,—GREENHOUSES.

I was speaking a few minutes ago of the different kinds of insects, those which bite and those which suck their food. Those that bite can be killed by placing poisonous matter on their food. Those that do not bite their food,—such as the San José scale, which is provided with a very minute tube through which it sucks its food in a liquid form, must be treated in a different way. The most useful substances for treating these are oils, such as kerosene and emulsions of it, which suffocates them, also poisonous fumes or gas, bi-sulphide of carbon, when rendered gaseous, and hydrocyanic acid gas. Fumigation with this gas has been experimented with at Washington, very carefully, during the last two years, and has been found to be the best remedy for use in greenhouses where many insect pests are sometimes found. The business of growing plants in greenhouses is now becoming in Canada a very important industry, and as plants when grown under glass are not subject to many accidents which may occur outside, they are frequently attacked seriously by various insect pests, and are very difficult to treat on account of the delicate nature of many of these plants.

It has been found that the treatment with hydrocyanic acid gas is valuable for greenhouses. When it has been learnt by experiment what strength of gas the



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different plants will stand, it is only a matter of calculating the cubic contents of the greenhouses and then giving the proper quantity which can be used with safety. There is probably a remedy for every insect known, but the difficulty is to get a practical one to destroy them at a reasonable cost without injury to the plants.

Fumigation by hydrocyanic acid gas has been applied so successfully in treating greenhouses that very much is hoped for from the method. The large violet houses which in many parts have been established in Canada and become an important industry are liable to become infested by an insect which has done much harm in the United States and has also occurred in one of our Canadian houses. This is the Black Violet Aphis, which is very difficult to treat, because the violet is a delicate plant which will not allow the application of many remedies used for hardier plants. But by the use of this gas we can now destroy this and all other insects in greenhouses. The gas is applied with care, then the windows are opened to let the gas escape as soon as its work is done and before the plants are injured. The great danger, as I have said before, is its exceedingly poisonous nature.

I began to tell you, but was drawn away from the subject by a question, about the fumigation of a train in South Africa which had become badly infested with bed-bugs, this will illustrate how intensely poisonous this hydrocyanic acid gas is. A Kaffir tried to go into the train to take a sleep, and when the custodian was not watching for a moment, the Kaffir jumped up on the platform and tried to enter the car, he merely opened the door and had not even passed the door when he fell unconscious and it was two days before he got over the effects of inhaling the fumes; so you can see that this gas is most intensely poisonous. Another name for hydrocyanic acid gas, is prussic acid, a better known name for this most deadly poison. Notwithstanding all this, it is a practical remedy in the hands of specialists. I lay stress on this, because if we are to recommend a remedy for use by everybody every feature of the case has to be borne in mind, or some accident may happen or injury may be done to trees.

## RECENTLY APPEARED INSECTS,—THE PEA LOUSE.

I have said that there were few new insects to report upon this year, nevertheless there are one or two which I should like to mention on account of their importance. The destructive Pea Louse. The pea crop this year was seriously infested by one of the plant lice, and it is a remarkable fact that this was an insect which never before had been observed in sufficient numbers to attract the attention of specialists; so we had to deal with what we call a new species, extending from the maritime provinces in the east to western Ontario, and north and south from central Ontario to the southern states. The damage was enormous among the pea fields further south, and in Maryland alone it is estimated that the loss was \$3,000,000. Now, the pea crop alone is not a big one compared with other crops, and when it is found that the loss in one state, and in this one crop, was as large as \$3,000,000, it shows the amount of injury sometimes done by insect pests. We had this destructive pea aphid in Canada, but not to that extent, though many crops were reduced to half what they should have been. The question naturally arises, are we likely to have it again next year? From what we know of plant-lice, I doubt this; and I do not think there is need for serious alarm regarding next season's crop.

*By Mr. Cochrane :*

Q. How does it affect the crop?

A. It sucks the sap from the pea plants and they die.

Q. As though the drought had struck it?

A. Yes; it was thought by most people that it was the drought which caused the injury, but when they went to look at the plants they found them covered with green plant-lice. One fact which makes me think that this pest will not be serious this year is that so many parasitic insects have been found accompanying the plant-

lice. In some places this pest was so badly infested with parasitic insects that on one farm in Maryland the farmer gathered up twenty bushels of green worms when harvesting. These were parasites of the plant-lice. Each one of these worms would require many scores of plant-lice for a meal, so that I hope we need not have much fear of many of them being found next season. In Canada we have also several kinds of these parasites, and doubtless owing to their good work there was not so much damage as further south. Not only was this pest found in the open field, but it was very bad in gardens, and I think there were with us more complaints from growers of the flowering sweet peas than from farmers. Farmers are apt to take an outbreak like this as a calamity which has no remedy, but to grin and bear it, but gardeners have not to complain of such pests so often, and therefore there was more complaint heard from them.

#### TREATMENT FOR PLANT LICE.

Those who grew flowering plants and looked after them very carefully were very much troubled and were sending frequently for remedies. The ordinary remedies for plant-lice we found to be perfectly effective for these, and the simplest remedy for plant-lice is whale-oil soap, now a well known remedy for this class of insects, in the proportion of one pound in six gallons of water. This remedy is rather expensive, and except for garden or orchard work is not perhaps a practical remedy. I should have mentioned, when you asked if there were any practical remedy for San José scale, that the preparations known as whale-oil soaps are merely fish oil soaps made with potash after a definite formula. Those soaps made by W. H. Owen, of Catawba Island, and the J. B. Good Company, of Philadelphia, are good soaps, and the use of these if done as recommended becomes a practical remedy. The proper quantity to use is two pounds in one gallon of water. When bought in large quantities these soaps are not very expensive—about four cents a pound, but even eight cents in one gallon of water will be thought by many to be a very expensive remedy when it has to be applied to large trees. If the soap has been properly made with potash, it is not too thick for spraying when diluted, and can be applied with a spraying pump. It is also claimed to be beneficial to the trees. Trees which have been sprayed as a general experience showing greater vigour. This is due to the amount of potash which they receive in the soap. The insect can be almost entirely eradicated with this spray. If two or three applications are made the trees will be fairly clean of scales and much improved in appearance.

An insect which has not yet given us much trouble in Canada, but which fruit-growers in the province of Quebec must expect to be troubled with before long, is the apple maggot, which is very prevalent in the states of Vermont and Maine. It is a worse pest for the apple-grower than the codling moth, the caterpillar of which attacks the apple chiefly at the core and then only eats its way out, leaving much of the apple uninjured. The Apple Maggot is the maggot of a fly which perforates the apple and pushes her eggs inside the flesh of the apple. From these eggs maggots hatch soon after, and eat their way through the apple in every direction, spoiling it utterly. There is no remedy which we can apply as a spray to reach this insect. The remedy which has given the best results is collecting the infested fruit after it falls to the ground and destroying it with the maggots inside it, so that they do not mature to destroy the crop of the next year. The most profitable method of destroying this fruit is to keep sheep or pigs in the orchard to eat up all windfalls as soon as they fall, and in seasons when the crop is small this remedy is very effective. When the apples are not abundant the animals all run to the spot as soon as an apple falls and pick it up immediately. The collecting by hand and destroying it in some way sounds easier than it turns out to be in actual practice. When there is a small crop it is easily destroyed, but in years when there is a large crop nothing is done, and consequently there is a large increase in insects the following year. It is sometimes thought and claimed that in a season when the crops are small it is not worth while treating orchards, but that of all seasons is the time to treat them most carefully, because if you can keep your apple crop clean when it is small, you will get a much



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higher price than in an ordinary year, and if you take pains to spray it, for the codling moth for instance, and by so doing produce fruit in a perfect condition, you will have a much more valuable crop than your neighbours, who, on account of the small crop, do not think it worth while to go to the trouble and expense of protecting it and consequently get nearly every apple destroyed or injured by this insect. Therefore, when there is a small crop, everything should be done to produce it in the best condition, so as to obtain the highest market prices, and by so doing and on account of this work a better crop is insured the next year.

The apple maggot ought to be known to all who are likely to suffer from it, and for that reason I have put illustrated articles on it in the annual reports of the experimental farms. The apple maggot has spread up into Canada from the United States to the south of us. There have been several instances of injurious insects gaining access to Canada in this way. That is they have been first introduced there and later have spread to Canada, but while we suffer from this disadvantage, our American friends give us also the great advantage of their special study of all these insects and pests. The United States is undoubtedly the most advanced country in the world with regard to the application of science to the ordinary matters of life. They have developed to a high point the economic study of the habits of insects, and it is very seldom we get from the United States any insect without being able at the same time to get from their official publications the best information available for the controlling of that insect.

## PESTS THAT INFEST CATTLE,—TREATMENT OF.

An instance which occurs to me now was the cattle horn-fly, which a few years ago did so much injury by attacking our cattle and reducing the yield of milk and beef. As soon as this insect appeared among us, knowing it was spreading from the United States, we were prepared for it, and the best remedies known were used at once and were found effective. The live stock interest is of course one of our most important resources in Canada, and the importance of protecting the animals from injury by parasites is very well known. Every practical farmer knows that he must expect in keeping stock, even with the best of care, occasionally to have some of his animals lousy, and a subject of frequent inquiry is: what is the best simple remedy? Probably seal oil with a little sulphur in it is as simple as anything which can be recommended, or 1 part by weight of powdered sulphur to 5 parts of lard. Kerosene emulsion we have also found excellent. There is no lack of remedies; the chief trouble is they are not used. It is only the men who are in earnest in their work that succeed; such men are all the time writing to know what they should do, and they apply the remedies when they learn them. The careful stock owner keeps his herds clean, and in consequence both he and they are very much benefited by it. At this time in the year the warbles in the backs of cattle are beginning to show. These are the large maggots found in tumours beneath the skin of cattle; they originate from eggs laid by a large fly during the previous summer. At this time in the year the swellings on the back are beginning to appear. The presence of these disgusting parasites is very injurious to the stock owner and most painful to the animals. They can be best destroyed at this time of the year. By feeling along the backs of the animals the lumps can be detected, and the maggots should be destroyed by placing on the lumps a mixture of lard and sulphur, rubbing it in well, and leaving a little lump of it on the small central hole which will be found at the top of the swelling and through which the maggot breathes. There are many mixtures which may be used, but I think that is the simplest effectual remedy. The maggot wastes away, the wound heals up and the skin is not injured. Like all other remedies, if applied early it is most effectual and the loss is least.

*By Mr. Cargill:*

Q. What is the remedy for the Horn Fly?

A. The simplest remedy is a mixture of pine tar and lard in the proportion of one part to ten. We have used this here for the last four years and the cattle were



treated in the pasture by the herdsmen putting a little on each animal when the fly was most troublesome, and the annoyance soon stopped. It was put on with a cloth and rubbed down the neck, chest, back and loins. For bulls which are shut up in the stalls we found it simpler to spray them with coal oil emulsion, a mixture of coal oil and soapsuds. This is on the whole better than the tar, but it is not a nice thing to make and we find many people prefer to use pine tar and lard.

*By Mr. Cochrane:*

Q. I don't know how expensive it may be, but I have very often seen pine tar used on calves.

A. Do you not mix it with lard?

Q. I just buy a little tin of tar and use it with a swab on the end of a stick.

A. It is more easily put on when you mix lard with it and just as effective.

Q. Yes, but spraying is not so effectual?

A. Your remedy would be more expensive and more trouble, and would mat the hair together more than the other does, which would make the animals uncomfortable as well as look very dirty.

#### THE PEAR-TREE FLEA-LOUSE,—TREATMENT OF.

An insect which should be better known and which has been treated of in the experimental farm reports is the Pear-tree Flea-louse, a small flea-like creature not very general in Canada as yet, but which should be known by fruit growers. This is one of the insects which passes the winter beneath the flakes of bark on the trees, but only on the pear tree. Where the trees have rough bark it is a good method to scrape it off with a sharp hoe not only to make the orchard look neater, but to prevent insects from passing the winter there. This should be done during winter over canvas spread at the foot of the trees. The insects are of course all torpid then and it is not so much trouble to exterminate them as in the summer.

*By Mr. McGregor:*

Q. Has your attention been called to orchards which look all right but won't bear fruit? A man in my section has a beautiful orchard with magnificent trees, but he has never been able, with all his attention, to make it produce fruit?

A. Perhaps his trees are all the same variety?

Q. No; I think he has thirteen varieties.

A. We now know that with some varieties of fruit trees there are some which cannot be fertilized with their own pollen. This is especially the case with plums. I have heard of some cases where the trees proved absolutely barren, or, at any rate, could not be fertilized with their own pollen. This is the case, to a large degree, with pears, and also, to some extent, with apples. As you say, however, that there are other varieties in the orchard you speak of, that theory will not explain the difficulty. I think if you ask Mr. Macoun, the horticulturist; he has had that matter brought before him. There was one orchard near Windsor and one in Quebec which I heard of lately where no fruit could be obtained, but in these cases, I think the orchards consisted of one block of apples of the same species, but that is not the case here. I will speak to Mr. Macoun about this and ask him to speak about that matter when he comes before the committee.

Q. Does the soil have anything to do with it?

A. No; an unsuitable or sterile soil would have the effect of throwing the trees into fruit. A very fertile soil, on the other hand, would induce a growth of leaves and branches. When a tree is placed under adverse circumstances, it endeavours to overcome these in a special way, viz., by throwing all its energy into the production of flowers and fruit, so as to save itself from extinction. This fact is taken advantage of by horticulturists when propagating new fruits. A large number of seedlings are grown from seed, of which only a very small proportion will be found to produce

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fruit of a sufficiently good quality to make it worth while to save the trees. Their quality cannot be judged until they come into bearing, and frequently this is not until after many years of care. It is a common practice, however, to force these seedlings into bearing at an earlier date than would be the case under ordinary circumstances, by pruning the roots severely. This has the effect of checking the growth, and the trees, in trying to save themselves, produce flowers and fruit. I would merely suggest that your friend might find it advantageous to try this experiment and prune the roots of his trees.

## THE OYSTER-SHELL BARK-LOUSE,—TREATMENT OF.

A destructive insect which has been too well known for over 100 years and yet with regard to which we have yet something to learn, is the Oyster-shell Bark-louse. With the exception of one or two small areas, this insect is abundant everywhere. It is a rather inconspicuous insect and, while it does not bear comparison in this regard with the San José scale, is still conspicuous enough to be frequently overlooked until it is too late to save infested trees. The usual treatment recommended is to spray the trees with kerosene emulsion, but this has not been found altogether satisfactory. The spraying has been usually done before the buds burst in spring, and again later during the month of June. The matter is again attracting special attention with the object of getting a more satisfactory remedy. Trees will be sprayed with various materials, and if a practical remedy can be discovered it will be a matter of great interest to the whole country. Arrangements have been made for spraying trees with whale-oil soaps made with both potash and soda, with potash and soda lyes, and with various preparations of petroleum. Mr. W. T. Macoun has been spraying some trees this winter with whitewash, which he believes to be a useful remedy. It is possible there may be something in this suggestion, for it has been noticed for some years that trees which have been sprayed regularly with Bordeaux mixture to prevent the black spot of the apple and other fungous diseases were not so much attacked by the Oyster-shell Bark-louse as others. This immunity it was thought was probably due to the lime which would remain on the branches after spraying, which it was thought was disagreeable to the young plant-lice at the time they were looking for a place to establish themselves. The life history of this insect is remarkable. It is only for two days after the young mite-like scale insect hatches from the egg that it has the power of moving about; after this it remains stationary, having attached itself to the young bark by means of its thread-like beak. It secretes a waxy scale over its body beneath which the females lay their eggs and then die. The eggs do not hatch until the following spring, and although there is only one brood in the year, this scale insect increases with great rapidity, so that they cover the whole tree, giving it a rough brown coating laid on as evenly as if the trees had been painted. When a tree gets to this condition, it seldom recovers. The same remedies recommended for the San José scale would, of course kill this insect also, but they have not been generally adopted.

*By Mr. Sproule :*

Q. Did you ever try putting ashes on trees ?

A. Yes, ashes have been tried, and it is claimed with good effect. Ashes of course contain both potash and lime, both of which are beneficial. The results, however, are hardly satisfactory enough for us to recommend the practice as a remedy.

*By Mr. Cochrane :*

Q. Do they get all over the trees ?

A. Yes, and the best results are claimed to have come from applying the ashes in the most unscientific manner one could imagine, namely throwing them up into the trees with a shovel.

Q. Yes, but I am talking about the lice ?

A. Yes, all over the trees. The best of results were claimed to have been obtained by a farmer who took his cart into the orchard with the ashes in it and simply shovelled them up into the tree.

*By Mr. Sproule :*

Q. That is what we have done ?

A. The material does not touch one quarter of the tree and a tremendous proportion is wasted ?

*By Mr. Cochrane :*

Q. Are the trees not more vigorous where the ashes are used ?

A. Yes, but the advantage is gained from getting the potash on the ground where the roots can feed on it, and the chief advantage I think in the case of infested trees is from the vigour which the tree gets, owing to the ashes which fall to the ground. The high cultivation of the soil in some orchards has been productive of greater vigour in the tree, which has enabled it to throw off the effects of the injuries done by its insect enemies.

#### ROOT MAGGOTS AND REMEDY FOR.

Another class of insects which we have been unable as yet to find a satisfactory remedy for, is the class of insects called Root Maggots. Of these, those which attack the different members of the mustard family, such as cabbages, cauliflowers, radishes, &c., are the worst. When radishes are grown in gardens, these may be protected by a mixture made some years ago by Professor Cook, of Michigan, and known as the Cook Carbolic Wash. This is made of two quarts of soft soap boiled in one gallon of water and one pint of crude carbolic acid. This makes the stock mixture of which you put one part in fifty of water when using it on vegetation. As soon as the radishes come above the ground this mixture is watered freely over the foliage and applied twice a week for three or four weeks, when it has the effect of preventing female flies which lay the eggs from which the maggots hatch, from laying their eggs at the roots. This remedy has been more successful with radishes than with onions, cabbages and cauliflowers, which is possibly due to the greater amount of foliage close to the ground, where the eggs are laid and which would have the effect of keeping the odour of the carbolic acid confined more nearly where the protection is required than would be the case with the other plants mentioned.

*By Mr. Cochrane :*

Q. Do they get in at the top ?

A. Yes; the eggs are laid just at the soil line, and the maggots at first burrow under the skin of the root and work down until they eat all the root away. They are very destructive to cauliflowers, more perhaps than to any other kind of cabbage plant.

There are a good many other kinds of insects which have been studied during the year, but perhaps the committee has had enough for to-day.

#### CUT WORMS ON CORN.

*By Mr. Sproule :*

Q. Is that the same grub which eats the corn off when it comes up ?

A. No; that is probably a cutworm, a kind of caterpillar. The best remedy for these is the one I mentioned before the committee last year—the bran and arsenic mixture—which is very useful in gardens. Corn, of course, is grown in large areas, which increases the difficulty of applying remedies; but in gardens a mixture of Paris green and bran has given very good results indeed.



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## THE BEETLE ON TURNIPS.

*By Mr. Burnett :*

Q. What is a good remedy for the Beetle on turnips ?

A. The best remedy is to dust the young plants with land plaster and Paris green as soon as they appear above the ground. That has been found very good by all who have tried it. We use it at the Experimental Farm every year and find it pays us.

## THE SPRUCE GALL LOUSE.

Q. What is the spruce louse ?

A. There are some insects which infest forest trees which have received attention. The Spruce Gall Louse is an insect which, although small, does a great deal of injury to spruce trees, and, as spruce wood is now used so largely in the making of paper, this insect has received a good deal of attention, particularly through the newspaper press. Statements were made that the whole of the spruce forests were going to be wiped out, but this is, I feel confident, is far too gloomy a view of the case. Where trees are grown for ornamental purposes the Gall Louse injures their appearance considerably. But, where they are grown for ornamental purposes, they can be protected by spraying them with a mixture of tobacco water and whale-oil soap, as we have done at the Experimental Farm.

*By Mr. Gould :*

Q. Will they attack all kinds of spruce ?

A. Yes, in time ; but, strangely enough, although probably imported on the Norway spruce, that tree in this country has not been as much attacked as the other spruces ; but, no doubt, it has been attacked and no record made of it.

Q. I have some Norway spruce trees on my land that were not attacked while others of a smaller size were.

A. That is one of the curious instances of an insect being the natural enemy of a certain plant, but under certain conditions not injuring it. Were the trees lately planted ?

Q. My brother got them as seedlings.

A. They were not planted this year ?

Q. No, five or six years ago.

A. I thought it might be some that were just planted.

Q. The large ones have been there twenty-five or thirty years and they are not touched. The small ones were.

A. At the Guelph Agricultural College they have a large windbreak of trees 20 or 30 feet high, which are very seriously attacked.

## DEFOLIATED SUGAR MAPLES.

*By Mr. Cochrane :*

Q. What is your opinion regarding the maple trees that have been completely stripped of their foliage ?

A. About tapping them ?

Q. Will they be all right to tap ?

A. That will depend on the extent to which they were defoliated. If they are not stripped again this year the injury will probably not be serious, but the question of tapping them this spring is rather a serious matter for owners of sugar bushes, and has been submitted to me several times. After reflection, I thought it wise to advise that some of the trees should be tapped a little ; so that the owners should not lose the whole crop, but might get some sugar for home use.

Q. There is a certain section of our country that the caterpillars cleaned out ?

A. Yes. In some districts it was much worse than in others, but I think on most of the trees there was afterwards a development of foliage to a greater or less extent, and where this was the case some sugar would be formed. Trees which

were able to lay up a good supply were probably not much stripped, and these might be safely tapped; but where there is little sugar this will all be required for the trees and taking even the small percentage of about five per cent which is usually drawn off when trees are tapped, might be very injurious to them.

*By Mr. Burnett :*

Q. Would you recommend scraping the old bark off apple trees ?

A. Yes certainly it would do no harm and would deprive some insects of a place to pass the winter.

Q. And washing the trees ?

A. Yes, as good a thing as any is simply to white-wash the trees.

Q. With lime ?

A. Yes, but that is an idea that some people do not like. In some parts of England it is a regular practice to whitewash the trees, and often too this is done for nothing but the neat and clean appearance; but it has also the effect of killing the eggs of many insects. In answer to your question as to scraping trees, it would be very useful against the Codling Moth which passes the winter as a chrysalis in crevices in the bark. Whitewashing the trunks also prevents moss growing on the trees.

#### ENEMIES OF FOREST TREES.

There are a few more insects I intend to speak of to-day but I will merely refer to them briefly in case any member wishes to ask questions about them. In the West the spruces were injured last year by a sawfly like the one which destroys currant bushes here. In addition to this considerable injury was done by the maggots of a gall gnat which attacked the ash-leaved maples in the streets of Winnipeg, disfiguring the leaves with fleshy swellings. I am of the opinion that spraying the trees with whale oil soap in spring will prevent the female flies from laying their eggs on the leaves.

#### THE NEGUND PLANT-LOUSE

has been treated very satisfactorily in some places with whale-oil soap and kerosene emulsion, the standard remedies for all of the plant-lice. The aspen poplars in Manitoba were stripped entirely of their leaves in many localities by a small beetle shaped somewhat like the Colorado Beetle and belonging to the same family. This is the Pallid Aspen Beetle. It has a green head and fawn-colored wing cases. It may be treated satisfactorily with Paris green and water where this mixture can be applied.

*By the Chairman :*

Q. There was a severe attack here in Ottawa and vicinity upon elm trees which bled so freely it was like tar on the sidewalks and grounds. Was your attention called to that ?

A. Yes, that was late in the season. It was by one of the Plant-lice or Aphides. It was not actual bleeding of the trees but the fluid came from the Plant-lice on the tree. They emitted little drops of honey dew and these shot out like rain and the sidewalks on some streets were rendered disgusting. Around houses where these trees were planted as shade trees, it was quite impossible to sit on the verandahs or walk on the paths with comfort. I do not think anything practical can be done to stop this on large trees, but anyone who can look back for a number of years, will remember that we have had no such visitation before, and I do not think it probable that we shall have a repetition of the trouble for some time. It was an unusual visitation by a Plant-louse just as was the case with the destructive Pea Plant-louse. This insect on the elms was a gray plant-louse which multiplied inside a distorted and curled up leaf. This made it impossible to get at the colonies by spraying. It is a well known aphid on the elm but one which does not often occur so abundantly as to injure the tree.

#### AWNLESS BROME GRASS.

Before I sit down, Mr. Chairman, I should like just to mention a few facts about Awnless Brome Grass, a very valuable grass for all districts but particularly for the North-west. It has now been reported on by some thousands of farmers to whom

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we have sent seed and almost invariably—actually by all except two I think—very favorably. It has as I have said on a previous occasion apparently solved the problem of producing a large crop of a succulent grass in our arid districts of the West. Not only is it one of the best grasses for fodder or hay but it can withstand very hard treatment and will flourish under varying circumstances. In the west it grows well on dry hillsides, and in the provinces of Quebec and New Brunswick it has been found a very good grass for swampy, mucky bottom lands.

*By Mr. Sproule:*

Q. What is the proper quantity to sow?

A. For Ontario?

Q. Yes.

A. Twenty pounds to the acre.

*By Mr. Semple:*

Q. Has it good fattening properties?

A. Yes, its chemical analysis is very good. I am almost afraid to talk about this grass because one has to claim so much for it that one runs the danger of not being believed. A remarkable fact is that the hay is little reduced in value by letting it stand till the seeds ripen, which is the case with very few grasses. In Awnless Brome Grass this is due to a second growth of fresh root shoots. This grass has many advantages. It will grow on dry land or wet land. It will grow better than any fodder grass yet tried on the alkali lands of the West. On Sable Island it is being tried to hold the sand in place, and at the same time the Superintendent, Mr. Bouteillier, reports very favourably of it as a hay producer.

*By Mr. Cochrane:*

Q. Can you seed it down with grain?

A. The general practice is not to seed it down with grain but to sow it by itself; however, I saw in the *Nor'-west Farmer* lately an account of a farmer seeding it down with wheat quite successfully.

*By Mr. Campbell:*

Q. What sort of a crop does it yield?

A. From two to four tons to the acre. Under irrigation at Calgary it gives an enormous crop.

*By Mr. Cochrane:*

Q. Have you any reports from Ontario?

A. Yes, but I have not pushed its cultivation in Ontario, because there are so many other grasses we can grow. It will probably prove valuable in the western parts of Ontario.

Q. We have found it difficult to get seed in Ontario?

A. It may now be purchased from all the leading seedsmen and a large quantity now being produced in Manitoba and the Territories.

*By Mr. Henderson:*

Q. How many pounds are there to the bushel of this seed?

A. I doubt if it weighs more than 16 or 18 pounds, for it is a light seed. I should judge it would be about 16 or 18 pounds.

Q. Something like orchard grass?

A. Very like orchard grass, not quite so light?

Q. Is it costly?

A. It is very expensive still, 25 cents a pound in small quantities, brought down to about 18 cents in large quantities. I might mention that I have still about a



hundred samples of seed left, and I should be glad to send some to anyone who would like to try it.

*By Mr. McNeill :*

Q. One pound samples, I suppose?

A. Yes.

Q. How much will one pound sow?

A. One pound will sow one-twentieth of an acre.

Q. I would be glad to get a sample?

A. You shall have it with pleasure.

*By Mr. Sproule :*

Q. What time is the best to sow this grass?

A. In the spring.

*By Mr. McNeill :*

Q. Would it do to sow it in the fall?

A. Yes, but it would be better to sow it in the spring.

Q. It has given as good results as timothy in the fall with us?

A. Yes, but our usual recommendation is to sow it in the spring.

#### WESTERN RYE GRASS.

Another good grass is the Western Rye Grass, a native grass brought to notice by Mr. McIver, of Virden, Manitoba, and I have also tried to make this better known by sending samples of it out to correspondents. It also gives good results, being a clean, straight, rich hay, the seed is easily cleaned, and any mixture of weed seeds is easily detected. It is the celebrated wild 'bunch grass' of the West, but under cultivation it becomes a better hay grass, much larger and more vigorous than the bunch grass of the bunch grass country.

#### PASTURE MIXTURES.

Of many permanent pasture mixtures, the Central Experimental Farm mixture that I have brought before the Committee on one or two occasions still continues to give satisfaction, and I doubt if it is possible to get a much better mixture than that which was published in the report last year, viz. :—

	Lbs.
Timothy.....	6
Meadow Fessue.....	4
Orchard grass.....	2
Kentucky Blue .....	1
Red Top.....	1

#### *Clovers.*

Mammoth Red.....	1
Common Red.....	1
Alsike.....	2
White.....	2
Alfalfa.....	2

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## TREATMENT OF NOXIOUS WEEDS.

*By Mr. Sproule :*

Q. You did not touch obnoxious weeds at all ; I presume that will be done on another occasion. Have you ever tried spraying for weeds ?

A. I did not touch on that subject to-day because I took it up rather fully last year. In my annual report this year will be found an account of some meetings held in the west, at which the chief subject discussed was noxious weeds. It is a most unfortunate matter in the North-west Territories. The subject of spraying to destroy wild mustard is probably the subject you refer to ?

Q. One of them.

A. The subject of spraying weeds has come up several times and opinions differ somewhat as to the value of this method. The plan proposed of spraying grain fields with sulphate of copper in solution to destroy mustard growing amongst the crop, sounds nice and easy and certainly can be done ; but I must confess I do not think it is a practical remedy. I believe the best means of cleaning land of wild mustard and all other annual weeds which sometimes spring up in fields of growing wheat or the other small grains, is to work the surface of the land after the crop is up, either with a weeder or with light harrows with sloping teeth. This will give the young crop just as much benefit as the same operation is known to give a crop of growing corn. Grain crops may be harrowed safely until the plants are 6 or 8 inches high. During the last three years this method has grown very much in favour in Manitoba and the North-west Territories, and much heavier crops have been reaped than where the fields have not been so treated. This increase in the crop is due not only to the destruction of the weeds, but from the great advantage the crop derives from the extra amount of moisture held in the ground, in the same way as is known to be the case when a field of corn is cultivated. No injury is done to the wheat plants by the teeth of the harrow or weeder dragging them up. The wheat seeds being sown with a drill, germinate and root much deeper in the soil than the small weed seeds which are close to the surface. Spraying will certainly kill the young mustard plants, but it is not such a simple operation as it sounds. In the first place, a proper spraying pump must be provided. It requires 40 gallons of water to every acre, and water is not always easily got near large wheat fields in the West. On every acre at least 8 pounds of copper sulphate must be applied and with the labour, the very lowest estimate of the cost is an extra \$1 to every acre of land under crop. Several of the large wheat farms of the West comprise many hundreds of acres, and after the farmer has sown his grain he sometimes never sees his field again until he turns in the reaper. In my own experiments I used  $2\frac{1}{2}$  pounds copper sulphate to the 10 gallons of water ; but Mr. Shutt finds that 2 pounds are sufficient. This reduces the cost somewhat. Possibly this method may find favour on small farms in the East, but in the West I maintain that the use of the weeder and harrow is far and away ahead of it as a practical method of clearing land of all annual weeds, including mustard, for which alone it is recommended. Spraying to destroy mustard is troublesome and expensive, while it is not more effective than the use of a weeder and the application of the weeder to the growing crops is one of the greatest advantages you can give them. It gives to the growing crop the same advantage that cultivation gives to a field of corn after it comes above the ground. In some districts where there is in some seasons not quite enough moisture to produce the very best results, this very weeding with the weeder gives the wheat all the advantages of cultivation and enables it to produce better crops by withstanding drought.

Q. Would you advise that for holding moisture in the soil ?

A. Yes, that is the very best means of retaining moisture. If the weeder is turned on directly the weeds are above the ground, you can keep on using it until the crop is six or eight inches high, to very great advantage of the crop and to the sure destruction of the weeds. The only difficulty is that in a wet spring it is sometimes difficult to get on to the land, but this is the case always, no farmer harrows except when his land is in proper condition, and there are very few springs when the

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operation cannot be practised. For the last 4 years in my lectures to farmers in Manitoba and the North-west I have done my utmost to persuade them to adopt this method which is well known and regularly practised by the best farmers in England and Scotland. Several have done so and are well pleased with the results.

*By Mr. Semple :*

Q. Is there a danger of too strong a mixture of sulphate of copper hurting the grain?

A. Yes, if it is too strong, but if it is of the proper strength as advised by Mr. Shutt, viz, 2 per cent it can be applied without injury to the plants.

#### TOMATO BLIGHT.

*By Mr. Pettet :*

Q. Have you had any experience with the tomato blight? I have seen some that seemed to turn black around the blossom end and we lost three quarters of our crop.

A. Is it the plants or fruit which is spotted?

Q. The fruit.

A. Yes, that is the Black Rot of the tomato, it is generally most abundant in dry seasons and has been treated successfully by spraying the tomatoes with the Bordeaux mixture, from early in the season. Some specialists maintain that this disease is not due to a parasitic fungus primarily, but the black velvety fungus merely develops on the tissues after they have become diseased from some other cause.

*By Mr. McNeill :*

Q. What time do you spray for the tomato blight?

A. Very early; at the time they begin to show flowers. In fact, with ours we spray from the time they are pricked out in the beds; we keep them covered with the Bordeaux mixture. There is another kind of fungus disease which destroys the leaves, and the Bordeaux mixture is also the best remedy for that.

*By Mr. Pettet :*

Q. It was a dry season, with us.

A. The disease you refer to is generally worst in a very dry season.

COMMITTEE ROOM No 46,  
HOUSE OF COMMONS,  
Wednesday, March 7, 1900.

The Select Standing Committee of Agriculture and Colonization met here this day at 10.30 o'clock a.m., the Chairman, Mr. McMillan, presiding.

THE CHAIRMAN,—We have got Dr. Fletcher before us here to-day. At the request of the Committee when he was here last week he was asked if it was possible for him to come back and address us on grasses. Prof. Fletcher will speak to us to-day on fodder grasses, pasture grasses, and noxious weeds.

DR. JAMES FLETCHER,—Mr. Chairman and Gentlemen,—At the end of the last meeting of the committee, as the chairman has said, some of the members wished to hear what had been done in reference to grasses and the fight carried on against



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weeds in different parts of the Dominion. I was glad to have an opportunity of speaking further of these matters, because a good deal of attention has been given them; but, as they were treated of at so recent a date, I did not think it necessary to take up the time of the committee unless asked to do so on this occasion.

## FODDER VALUE AND SOIL USES OF AWNLESS BROME GRASS.

I took occasion at the last committee meeting to speak of the value of Awnless or of Smooth Brome grass. It was introduced into American agriculture largely through the work of our Experimental Farms. It is now well known and of particular value in the North-West Territories and the drier districts of the West. It is also grown in all the provinces and with a considerable degree of satisfaction, as is reported by those who have grown it. As I said at the last meeting, the success which has accompanied the growing of this grass is one which makes it hard to speak of it, because no matter what the conditions may be it nearly always turns out to be the best grass to recommend. In the far West, in the alkaline districts of British Columbia there are some small areas to which, by courtesy, the term arid is applied to a country which is more nearly desert than arid, it succeeds best of any of the grasses which grow without irrigation. Further east, at Calgary, where water is available, it has done remarkably well. Where water is not available it has done better than any other grass, and in Manitoba it has now become a standard crop.

When you remember that it is only since the starting of the Experimental Farms in 1887, that this country has known this grass you can understand how valuable it must be to become so well known in that short time. I learn from a recent bulletin that it had been grown at the California Experimental Station in 1884. In 1885 seed was obtained by us from Russia and in the next season several small packages were sent out to farmers in Canada, who we knew were interested in the growing of grasses. As early as 1887 Mr. Routledge of Virden wrote down to us to say that he had tried the grass with great care, and as far as he could see it had settled the question of a large supply of fodder for dry districts, in the West, which at that time was known to be a most serious question. This was because the native grasses which were then the only source of fodder in the West got lighter and lighter as they were fed off and the land was brought under cultivation. There are many kinds of native grasses varying in quality, but they must be re-seeded and treated like all other grasses to get the necessary amount of fodder from them to make it worth the farmers while to look after them.

On account of the success which has attended the cultivation of Awnless Brome Grass in Manitoba and the North-west, others than farmers have tried it, and it has been grown for such various objects as holding drifting sand in dry, sandy districts, and it has also been found of great use in swampy bottom lands. In lands which are too swampy for cultivation under general farm crops it is found to be so satisfactory that some farmers who have tried it, now grow it to the exclusion of all other grasses. Its usefulness, however, is greatest in the North-west. When fully tested by chemical analysis, it is shown to be well worth growing, and the hay is nutritive and palatable to all kinds of live stock. We have considered it so valuable that for the last seven or eight years we have distributed a large quantity of seed to farmers, and the success of the last few years warranted us in sending it out in one-pound packages, each of which is enough to sow one-twentieth of an acre. Its value is getting to be recognized by seedsmen, and, when a plant once becomes known to them and the demand lowers the price of the seed, it soon becomes established. We shall soon have no further need to distribute this seed; but for the last four or five years we have been distributing these one-pound packages, and these have been so much asked for that it has now been tried in almost every part of Canada. We have some this year, and I would be glad, as I said last week, if any gentleman who wants it for his constituents to try, will give me their names and addresses. There is no large quantity, but I think I have 140 or 150 of these packets left, and I shall be glad to send them to any farmers whose names are sent to me. A member asked me at the

last meeting what the seed weighed per bushel. It is a light seed, and weighs only 14 pounds to the bushel, and the retail price in large quantities is now, I find, in Eastern Canada 20 cents in large quantities, and 25 cents in small quantities. I am told that in the North-west, where the grass is so largely grown, the farmers have a lot of good seed which they are selling at 10 cents.

*By the Chairman :*

Q. Per pound ?

A. Ten cents a pound, yes. This seed is very good, and I found it advisable last year to get all our seed from the North-west. We find that our western grown seed is very good, and we have not the trouble of cleaning it from weed seeds, such as are found in the seed brought from Germany. Germany produces grass seeds of various kinds, and we find it a good country to get seed from, as they make a specialty of collecting seeds, either from wild plants in the mountains or from small grass farms. Several bad weeds, however, have been introduced from Germany, so that we are rather shy of getting seeds from that quarter if we can avoid it. As for the wild seeds of the North-west, there is little danger of these being transferred down here. Every plant has its own habitat. Those weeds which grow in the dry West are not likely to become dangerous weeds in the moister atmosphere and conditions which prevail in the East.

#### WESTERN RYE GRASS.

Another grass which we have grown with very great success and of which we have distributed a good deal of seed, is the one to which has been given the name of Western Rye Grass. This belongs to the same family as the Couch grass or Quack grass, but has not the same bad habit of throwing out underground stems. It is a bunch grass, and is, in fact, the well known and famous "bunch grass" of the West. It grows abundantly in the foot-hills and on the lower slopes of the Rockies, and from its value as a grass for stock has given its name to the district which is known as the "bunch grass country." It is an exceedingly rich, palatable grass, and one which, under cultivation, has given excellent results. I have here a sample of it, and you can see what an excellent kind of hay it makes, a perfectly straight smooth and clean hay. When grown in the arid districts of the West, it is very seldom more than from a foot to eighteen inches high, and when looking across a bunch grass country, it looks only about a few inches high; but on examining it, it is found to be from a foot to eighteen inches high.

This sample was grown in Quebec Province, and it is the same grass grown from western seed. It has the characteristics of excellent hay in that it is clean and straight, so it can be easily handled. It produces seed profusely, which is easily cleaned and handled. The quality of the grass and hay are excellent. Moreover, it has given almost as heavy crops as the Awnless Brome grass, and those who have grown it have been well satisfied with it. It has been distributed to a smaller extent than the Brome grass, because when growing it does not appear to be so attractive. Anyone growing the two grasses together, and judging from appearances alone, would never think that this was as heavy a cropper as it is.

This is a very valuable grass well worth growing in the West. It is not troublesome in the land in any way.

*By Mr. LaRivière :*

Q. Is that an imported grass ?

A. No, it is wild in Manitoba and the Territories. It was brought to my notice first by Mr. McIvor, of Virden, who has cultivated it for many years.

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*By Mr. Burnett :*

Q. Is the Brome grass suitable for high land, or is it liable to winter killing ?

A. It stands the winter very well indeed, both at Indian Head where they have long winters with the thermometer low and little snow, and at Brandon in Manitoba. I had a long letter a couple of weeks ago from Algoma, in which it was stated that this grass was exposed to a temperature of 60 below zero, which is not unusual in that country where they generally have a good depth of snow, but they had none last year and the Brome Grass is in excellent condition this spring. This letter was from Mr. Aaron, of Wabigoon.

*By Mr. Erb :*

Q. On the farm here have you tried it in large fields ?

A. Yes, on patches of a few acres, and last year on several acres. We have had it on one-tenth acre plots and one-twentieth acre plots for some years, and last year we had three or four acres in it.

*By Mr. Sproule :*

Q. How does it yield in tons per acre ?

A. It gives a very excellent yield, as much as three or four tons to the acre.

*By Mr. Semple :*

Q. How much does the rye grass yield to the acre ?

A. It is not easy to judge here bulk for bulk, but it is a heavy grass and yields from two and a half to three and a half tons under high cultivation in Manitoba. There are several reports upon it in the Experimental Farms Reports, both by Mr. Bedford and Mr. Mackay.

Q. Does it grow well in Ontario ?

A. It has never been cultivated very much in this province, and might not be considered a sufficiently productive grass for the East. It is more of a dry land grass. Here we have Meadow Fescue and Orchard Grass, and other succulent Eastern grasses. Our methods of farming seem to require something different. Where we can grow Indian corn, there is no grass that will give the same crop acre for acre and Indian corn under the same cultivation will probably produce more to the acre than any other grass that is known in Western Ontario. During the late three or four dry seasons the cultivation of corn seems not to have been as satisfactory as it was in the past, and some farmers have been growing a new crop for early feed—a combination of peas, wheat and barley or oats, a mixture of peas with one or two kinds of grain, a bushel each to the acre and cut just as the seeds are ripening. Some farmers write that they thought they were going to give up corn and use this new crop. I believe, however, it would be a great mistake if they did, because Indian corn is a very valuable crop in this country, and I cannot understand why farmers in the western districts of Ontario should think of giving up corn, because corn will stand as much, if not more, drought than any grass we know, if properly cultivated during the hot weather.

*By Mr. Cochrane :*

Q. Is not corn a more exhausting crop to the soil than grass ?

A. Yes; but I do not know that it is an unduly exhausting crop; that is simply a question of balancing accounts. It is a question of debit and credit. It pays to grow corn well and give it plenty of manure and all the cultivation it requires. I think where some farmers fall short is in the amount of cultivation of the soil after the crop is up. But, of course, there are men here to-day who know better than I do what can be done in Western Ontario, having themselves worked the land. I have only examined the crops when visiting the districts.



*By Mr. Cochrane :*

Q. But you must have a certain amount of grass seeded down to have a proper rotation?

A. Undoubtedly, but the question was the giving up of corn because of the drought.

Q. The question is how this grass compares with other grasses in Ontario?

A. I would not cultivate any mixture instead of corn in a country where corn can be grown successfully.

*By Mr. Bell (Addington) :*

Q. You say it would be foolishness for any farmer to give up corn for these grasses?

A. I think it would be foolish to give up corn in any place where it will grow. The grass I have mentioned is not a substitute. It is a permanent grass very suitable for cultivation in the West where corn will not grow; when once sown it will remain in the ground for several years. In the West it is a very valuable grass and my object in bringing it before the Committee is to show you a valuable grass, one of our native grasses and one that should be advertised freely, as it can be through this Committee in the same way as the Awnless Brome grass has been, which I claim is one of the most valuable grasses we can grow on this continent. One of the ways in which Brome grass has been brought to the notice of farmers is through the reports of this Committee and from having members of the Committee let people know of it. We have sent out many samples as I said at the last meeting, and I only know of one or two who were not pleased with it. This is somewhat remarkable because it has an underground root system similar to the well-known enemy, Couch Grass, but it has the very great advantage of producing a large amount of feed which perhaps overcomes this objection, and the objection has never been mentioned by those who have tried it. It is generally brought forward by those anxious to know before planting it if it can be got rid of. It certainly can be got rid of. In the West, where summer fallowing is part of the recognized rotation of farm work, there has been no trouble in killing it by breaking and backsetting at the proper time. In the moist lands of the East it can be overcome by deep plowing and the ordinary methods of eradicating perennial plants.

*By Mr. Hurley :*

Q. Is not the Brome grass the same?

A. It is the Brome grass I am speaking of.

Q. We sowed some of it and we cannot get it out?

A. I think you can get rid of it by the ordinary methods of cultivation, at least, we have found this to be so on the experimental farm.

Q. Is Brome grass a permanent grass?

A. Yes, both of them are permanent grasses that I have spoken of. In fact the Brome grass does not make its full head of growth until the second year. A great many reports have been received from those who had received samples, saying that the first year it was very thin and they were afraid it had not taken, but the second year it was an excellent crop, far surpassing their anticipations.

*By Mr. Featherston :*

Q. It stools out?

A. Yes.

#### SEEDING BROME GRASS.

Q. Like timothy?

A. Very much more than timothy. One of the troubles we found in getting it introduced was that a great many people did not understand it, there was such a diversity of opinion about the proper amount of seed to sow. We recommend 15 to

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20 pounds to the acre, but in the last issue of the *Nor'-west Farmer*, a writer there says he used only 8 pounds to the acre, and drilled it in with grain and got excellent results. I saw some of the crop he referred to when I was in the West last summer, and it was a splendid sample. He used 2 bushels of pease to the acre and seeded the grass with it. That was only 8 pounds to the acre, and he found it thick enough. With seed sown in drills much better results are obtained than when sown broadcast. There is a great deal of the seed wasted in broadcast sowing. Birds pick up a great deal of it that is not buried, and those seeds which are not buried deeply will germinate quickly and are dried up for want of moisture, so that much of the seed is wasted.

Q. If the ground was rolled just after seeding it would cover up that seed?

A. Of course it would to a large extent, but unfortunately it is not very often rolled; farmers just simply harrow in the seed and then leave it to take its chance.

*By Mr. Bell (Addington):*

Q. This Brome grass, how does it succeed on damp soils like muck lands?

A. It has done well in New Brunswick on black muck lands, even where there was little soil. It has done very well indeed in some of the interval lands both in New Brunswick and in the province of Quebec.

## TIMOTHY AND CLOVER HAY.

*By Mr. Erb:*

Q. What are its advantages on soil like that on the Ottawa farm? Would it be advisable to substitute Brome grass for timothy and clover for the bulk of the hay crop?

A. No, timothy and clover hay not only is of very great intrinsic value but it has an artificial market value too. Its intrinsic value is attested by the fact that the Government when sending the large quantity of hay recently shipped to South Africa asked for nothing but timothy and clover, this mixture was wanted because it was known to have great value. Besides it would be no gain to a farmer to substitute anything for timothy and clover even if it had greater intrinsic value unless that fact were well known and acknowledged; for people would not buy it; you would be out of the market. Timothy and clover is a hay which sells in the market on sight. Anyone who has a good crop of it knows he can sell it; therefore, it would not be advisable for a farmer to substitute Brome Grass for timothy and clover, unless he were growing for his own use, in which case of course it would be for him to consider which he would prefer. It is very hard to substitute anything for timothy and clover on the market. You can add to this supply of feed by growing corn for feeding green or as ensilage. If you have rough lands that will not produce timothy and clover you can then grow Brome Grass to advantage. A great deal of attention has been given to this grass in the interest of the Western provinces because some years ago we knew little about the climate and what crops would succeed, and there was no experience to draw on with respect to what other people had grown successfully. We had therefore to watch carefully and study the requirements and possibilities of a new country. All over the North-west Territories we have excellent men as correspondents who are accumulating information of value to themselves and others; the farmers there are I think more of a reading class of men than we have as a rule in the East. I find that all the farmers there are keen to know what is best for them to do and they read religiously the agricultural journals. You can hardly go into a house that you can't find three agricultural papers there, the *Nor'-west Farmer*, the *Farmers' Advocate* and the *Weekly Star*.

*By Mr. Broder:*

Q. They have more leisure time?

A. I do not know about that. I can't say anything about that, but I do say they want to know. On account of the difficulties of the situation more effort has been made to try new crops in that country and Awnless Brome grass has been one

of the valuable results of these efforts. In the East as I have mentioned, we cannot do without corn. It is a most valuable crop and we must stick to it. In this part of Canada where we never have either heavy failures or prodigious successes, but always get a pretty good crop, we can try nearly all the crops recommended for farming in Canada. But when we get down to the sea, to Nova Scotia and in British Columbia, we find more nearly the English conditions and can make use of information found in English books and papers. To give an illustration of this, in Nova Scotia and the other Maritime Provinces they can grow to perfection many of the rich English grasses that we can't succeed with here at all. Anyone that takes any interest in the hay crop always likes the Sweet Vernal grass, which smells so very sweet. We can't have it here, simply because it will not grow; but in Nova Scotia it grows and succeeds very well, and in British Columbia the same. In Nova Scotia, British Columbia and New Brunswick it grows well. Then there is the Meadow Foxtail which we can't grow up here at all, but in Nova Scotia it succeeds so well that it has become wild and is somewhat of a nuisance in hay meadows. As it ripens earlier than the other grass, it is always ripe and at its prime before the other grasses are ready to be cut for hay.

#### MIXED GRASSES.

In mixing grasses for pastures or for hay, it must be considered when the different grasses used will be at their greatest state of perfection. With hay grasses that is almost invariably when the flowers have passed away and the seed has begun to form; the food elements are then distributed evenly throughout the whole plant, and if the grass is cut at that time, it is more valuable for feed than later. After that period a large proportion of the nutritious principles is transferred to the seeds. Consequently, unless grass is cut before that takes place, its food value is very much reduced. Awnless Brome grass is an exception to this rule, for although nearly all grasses are reduced in value as the seed ripens, from a special circumstance, Brome grass is not, and the hay upon which the seeds have been allowed to ripen before cutting, is worth almost as much as though cut at an earlier stage. This is due to the fact that, as soon as the seeds form, a new growth of young shoots takes place from the root, so that the late cut hay is heavier and thicker and of an equally good quality as that cut in July when the seeds were just forming. A great deal of the hay made by Mr. Mackay during the last year or two at the Experimental Farm at Indian Head was Awnless Brome grass from which the seed had been threshed. This was because we wanted the seed and we found the hay equally good. Of course a grass that is allowed to ripen its seed draws off a larger amount of nourishment from the roots than it is advisable to take if heavy crops of hay are to be cut for more than one or two years. Where the seed was allowed to ripen we found that the next year's crop was very much less. If Brome Grass or any other grass is grown for hay only, it is advisable to cut it as soon as possible after the flowers have fallen, and then in those kinds which give an aftermath you have a good crop in the autumn and without the same weakening effect on the plants which I have referred to.

#### PROPORTIONS FOR MIXED SOWING OF TIMOTHY AND CLOVER.

*By the Chairman:*

Q. There is just one important point in regard to the mixture of clover and timothy in hay for sending to the old country: There is such a large quantity going this year and Canadian hay is taking such precedence in the English market and as there may be a very extensive trade spring up, I think it would be well if you could say how much clover should be put in to give the best mixture.

A. I am afraid that I cannot answer that question off-hand, because clover in a certain sense has an artificial value. To find out what proportion these plants should bear to each other, we have mixed clover and timothy together in various quantities and find that a mixture of 12 lbs. of timothy to 8 lbs.



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of clover gives the best crop with us here on the experimental farm. Many farmers in Western Ontario, sow less timothy than 12 lbs. and do not care to grow clover as much as we do here. In some places they seed down with as small a quantity as 4 lbs. of timothy and get a good crop. If we were to sow only 4 lbs. timothy here, it would not give us any crop worth cutting. We have tried at the experimental farm a large number of mixtures, starting with 4 lbs. of each and running as high as 16 lbs. of each, and we found, as I say, that the mixture which gave us the best hay and the largest quantity of it was 12 lbs. of timothy and 8 lbs. of clover. The proportion of clover which should be allowed in hay of first quality is to a large measure a matter of taste. Some people won't buy hay if there is any clover at all in it.

*By Mr. Featherston :*

Q. That is for horses only ?

A. Yes, I know ; but I am speaking of the market, and the requirements of the market seem to vary. A few years ago in the market here in Ottawa, buyers would have no clover in hay. If there was any clover among hay, they would decline to buy it and say : " We do not want any clover in hay." Last year, however, opinion had changed and mixed hay sold well here. The only answer I can give to the chairman's question then is that with us here a mixture of 12 lbs. of timothy and 8 lbs. of clover has given the heaviest crop of what we consider first class hay for all stock.

*By Mr. Cochrane :*

Q. Has the experimental farm any knowledge of the proportion of clover and timothy which was shipped to South Africa ?

A. Yes. I do not myself know exactly what the proportion was ; but I think about  $\frac{1}{4}$  or  $\frac{1}{5}$  of the hay was clover, it was examined by some of our officers and no doubt they had a fixed standard.

*By Mr. Broder :*

Q. When you want to feed hay to cows, the mixture of clover with timothy is right, but for horses you want clear timothy.

A. This hay was for horses, mules and oxen.

*By Mr. Featherston :*

Q. I find that hay which is made up of half timothy and half clover, sells better in the English market than hay which is all timothy.

A. Do they like as much clover as that ?—Well, the mixture of 12 lbs. timothy and 8 lbs. clover which I have mentioned would about give half and half, but what was demanded by the government for South Africa, was, I think, a smaller proportion of clover than that.

MR. COCHRANE.—It seems to me, Mr. Chairman, that this is an important point, because if there is a market we want to know what its conditions are and what is the class of hay which sells best.

THE CHAIRMAN. That is the very reason I asked the question, because it is of great importance to know what the best quality of hay for that market would be.

DR. FLETCHER.—Well, if hay consisting of equal parts of timothy and clover is required, seeding with 12 pounds of timothy and 6 or 8 of clover will about give that proportion the first year ; in the second year the timothy will preponderate ; but, as every one who has grown clover knows, this crop is very much affected by the season. In the first year after seeding, clover makes the bulk of the crop and holds down the timothy, but in the second year the timothy gets the upper hand. I believe it is impossible to give the exact amount of seed which would produce hay with certainty which would be half and half.

*By Mr. Cochrane :*

Q. There was a thought struck me in what you said about Brome grass. Did I understand from you that, if we had Brome grass, it would not do to sow peas with it, the roots would be so troublesome?

A. No, I didn't say that. I don't think that you would have very much trouble in doing that. If you wished to do so, you could certainly sow Brome grass with peas. Peas would not be a very good crop to sow grass with, because peas cover the ground so thickly that they would smother out much of the grass.

*By Mr. Wilson :*

Q. What is the smallest amount of seed from which you can get a good crop?

A. Do you mean here in this district?

Q. Yes, of timothy.

A. Well, about the best mixture was 12 pounds of timothy and 8 pounds of clover; but in favourable seasons less seed will answer. Clover is so apt to be winter-killed, that unless plenty of seed is sown, an occasional crop is sure to be lost. With the quantities I have mentioned we have never had a failure.

Q. Some people say 6 pounds is best.

A. Yes, that may be enough in some localities, and in certain seasons; but the mixture I have given you is the one which we have found from our experiments here to give the heaviest and surest crop.

*By Mr. Calvert :*

Q. A good deal depends on the land and the season?

A. Undoubtedly, and also, I think it depends largely on the amount of generosity which a man feels when he is buying seed. Plenty of people would sow more seed if they were wiser. One trouble we have among farmers in Canada is that they sow too little seed. If a man would spend a little more when buying his seed he would find it pay him well; a few cents saved in buying a pound or two less seed to the acre is very poor policy.

*By Mr. Bell (Addington) :*

Q. In your opinion the mixture should contain not less than 12 pounds timothy and 8 pounds clover?

A. That is my opinion.

Q. That is my opinion too.

A. We cannot sow less and get sure crops every year.

*By Mr. Semple :*

Q. It depends on the season, whether moist or dry?

A. Yes. We never had such clover in this country as we had two seasons ago. It was as high as my waist and as even as a billiard table. The condition of the soil also makes a difference. When the soil is moist every seed you put in will grow, both of timothy and clover. With all the conditions favourable, less seed is required to get a good catch. It is even possible, if the quantities I have given are exceeded, to sow too much seed, when the young plants crowd each other and do not develop properly.

#### PROPERTIES OF VARIOUS NATIVE GRASSES.

I will now draw your attention to this sample of native grass which closely resembles the Awnless or Smooth Brome grass, it is known as the Western Brome grass (*Bromus Pumpellianus*). It is common in the foot-hills of the West. It has given good satisfaction in some districts; but its usefulness is much more limited

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than that of the Awnless Brome grass. It does best in the foot-hills, growing generally in woods or in coulees, and gives better results there than even the Awnless Brome.

## BALD WHEAT GRASS.

Another native grass which I will call your attention to is this of which I have a very fine sample with me to-day. It is called the Bald Wheat grass (*Elymus submuticus*). You see that the head bears a close resemblance to an ear of beardless or bald wheat. It is an exceedingly heavy cropper and is of very good quality. It gives little aftermath but furnishes a large crop of smooth clear, heavy hay, of good quality. The head contains much grain if the hay is left until the seeds form. For some reason, this grass has not become a favourite with farmers; but I consider it well worthy of more attention than it has received.

*By the Chairman:*

Q. Where does it come from?

A. It is found in Manitoba along the river sides, and is a western variety of the Virginia Lyme grass. It is a very rich and heavy grass, and gave the heaviest crop on our experimental plots of all the native grasses we have grown.

I will now show you a very fine sample of the ordinary timothy which was grown in the Algoma district, and it illustrates how well fitted that country is for growing timothy.

*By Mr. Bell (Addington):*

Q. I think that is rather above the average?

A. Yes, undoubtedly it is. It was sent in, however, as an ordinary sample. Timothy seems particularly well adapted to that northern country. I once collected a bunch of it at Sudbury while walking along the railway track and was able to gather quite a large bundle of which the stems were actually 7 feet high. This was several years ago, before the vegetation in that district had to such a large extent been spoiled by poisonous fumes from the mines. It seemed extraordinary to me that timothy should grow to such size on the bare clay banks of the railway where there was apparently little food for it.

Of course, it does not attain any such height as that I have mentioned when cultivated in fields at Sudbury.

## NORTHERN BLUE JOINT.

Another excellent native grass to which I will draw your attention is the Northern Blue Joint (*Deyeuxia Langsdorfii*). It is one of the few grasses that will grow actually in water. It grows naturally on cool damp rocks and by lake and river sides. It is closely allied with the Common Blue Joint, and, like it, is essentially a low land grass which produces a large crop of soft leafy stems. The only trouble is that it is hard to get the seed to ripen well and the seed is not to be bought in the market. Every one who sees this grass growing at the experimental farm asks for seed and every seed we can grow is sent out to correspondents; but I have not yet been able to get a sufficiently large amount of seed to get it thoroughly established. It is a form of the ordinary Blue Joint found all over the continent, which is also very good grass. Some farmers have collected the seed of the latter on their farms and cultivated it to some extent. The Northern Blue Joint was collected on the rocks north of Lake Superior and is rather a better hay grass than the ordinary form, the stems being more slender and bearing more leaves.

*By Mr. Calvert:*

Q. Will it grow well on high lands?

A. Not very well on high dry lands, but in lands suitable for ordinary crops it succeeds admirably. The Grass Plots at the experimental farm are neither very



high nor very low where this is grown. There is one low part at the bottom and the land gradually slopes up to a higher level. The plot of this grass is about half way up, so that it will succeed very well on ordinary farm lands.

#### DROP-SEED GRASSES.

I now show you samples of two grasses which I think will be thought to be of considerable value when they are more cultivated. They both belong to the same family of grasses called the Drop-seed Grasses. They are very late in maturing; the hay is not ready for cutting till August, and a good succulent crop of hay in August is very valuable in many parts of the country. The hay is particularly heavy for its bulk, nutritious, and much relished by stock. The stems are rather harsh and woody at the base, but there is a sufficient quantity of good succulent rich grass at the top to render these grasses well worthy of cultivation. They are known by the names of Satin Grass and Wild Timothy. As can be seen from the sample I have here, the heads look something like timothy although the two grasses are not at all closely related.

#### FRINGED BROME AND HOOKER'S BROME.

I will now show you samples of two more kinds of the Brome grasses, one mentioned because it is not particularly valuable; the other because it is. I speak of the first one because it is an attractive looking grass and many farmers throughout the country who have become interested in grasses and were looking out for new grasses have almost invariably hit on this one and cultivated it to some extent. It grows three or four feet high and produces much seed; but I do not think it is as well worthy of cultivation as many others. The seeds very soon become hard. There is an enormous amount of seed and the weight of hay produced per acre is light for the amount of growth. It is called the Fringed Brome, and it is recommended by many writers on grasses; but is a grass I do not feel inclined to recommend.

On the other hand there is in British Columbia a wild grass growing in the coast range and on Vancouver Island, which produce a heavy crop of rich succulent grass. Although sometimes rather small this grass is well worth cultivating. It is a perennial grass and late in the season produces a heavy aftermath. This grass is of value because it gives a crop of green grass at a time of the year when most grasses are dried up. It is called Hooker's Brome grass and is very much like Schrader's Brome grass.

*By Mr. Featherston :*

Q. Have you grown that here ?

A. Yes. This sample was grown here. It is not a very tall grass. It looks better tied up in a bundle in this way than it does when the plants are growing wild; it has rather a drooping habit, but we take the weights of each kind we grow and thus have learned that it produces a heavy crop. It is a grass that has been grown for a good many years by Mr. Duncan, of Duncan's, Vancouver Island, and he has a plot of it which he saves until later, when his other grasses have been fed off.

#### TALL OAT GRASS.

I have here a bundle of Tall Oat-grass, a grass which under the name of 'Fromental' has been grown to some extent in the Province of Quebec. I do not consider that it is a grass of any particular value either for cultivating alone or even for mixing with other grasses, because it is not a grass that produces a very heavy crop. Most writers who have referred to it state that it has a bitter principle. I have never been able to detect this myself; but it is claimed that this is one reason why it is so useful, because it acts as a tonic. It is rather a nice looking grass but we have other grasses much better, and I do not think it should be recommended for very extensive cultivation. In the autumn it throws up long leafy barren stems, that is without flowering heads, but bearing leaves all the way up the stem. A good point is that the seed is always abundant and can always be

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obtained from seedsmen. This is a rather important feature because there are many grasses I would like to recommend if the seed was available, but unfortunately it is not.

## ONE SIDED WHEAT GRASS.

I have here a sample of another very heavy native grass which, however, has not proved attractive to farmers and they do not care to bother with it. It is the one-sided Wheat-grass, a native that produces a heavy crop. Farmers who have tried it generally say it is a good grass, but do not raise it again. There is a good deal of beard about the heads, and I think that is the reason farmers haven't taken to it. It is a very heavy cropper.

The Tall Fescue is one of the most valuable English grasses, and has been introduced into all parts of Canada. It is very valuable in Nova Scotia and the other Maritime Districts, both on the east and west coasts. It is also useful in Ontario. It is a deep feeder but one which is rather a heavy feeder on the land, and possibly, for that reason, I think it has not been accepted to the extent it might have been. It is certainly a very valuable grass, very succulent and always a heavy cropper, particularly for the first three years.

Red Top is a grass which should be sown in all wet land, and particularly on such lands as are too wet for general farm crops. It is now thoroughly established as a wild plant in all parts of the country and can easily be distinguished in low land by the feathery reddish purple heads and slender stalks. Some of its special uses are that it forms a thick bottom in hay, and on wet boggy lands which will not bear the weight of stock it soon forms a tough sod which prevents animals from sinking. The hay is light but of fair quality, and it is well to put some in all mixtures for low ground.

## RHODE ISLAND BENT GRASS

Is a grass which grows in the Maritime Provinces and is very often recommended for lawns, but it has no special characteristics that make it preferable to the ordinary Red Top, and as the seeds are very much more expensive, the ordinary Red Top answers as well. It is rather finer and has a better colour but has no especial agricultural value. It makes, like Red Top, a thick bottom, which is one of the desirable features of a good hay grass.

## FOWL MEADOW-GRASS.

I have here a bundle of a grass of much value which in Manitoba is known by the name of 'Red Top.' It is not Red Top, nor does it belong to the same family; the proper name is Fowl Meadow grass. It is one of the Poas and is much more nearly related to the Kentucky Blue grass. It is an extremely valuable grass, which grows in low lands and is particularly abundant around the large sloughs which you find in the wooded country of the North-west Territories, and wherever there is an extensive hay slough in Manitoba it is almost invariably covered with this grass to the exclusion of all other species. It has a special value, because, like Awnless Brome grass, after the seed is ripened, it throws out fresh shoots from the stems which remain green, giving the grass extra value, from this special circumstance.

## KENTUCKY BLUE GRASS OR CANADIAN JUNE GRASS

Is one of the most valuable grasses that grows, and, best of all, it is a grass that is known to everybody. It is a grass that in various forms is native all over Canada, and it has also been introduced under the name of Smooth-stemmed Meadow grass, which is found in the English catalogues. These forms all resemble each other somewhat, and it is difficult to separate the native forms from the imported. The variations are chiefly in the number of stems produced, or the quantity, length or colour of the leaves. Some are much more valuable from an agricultural standpoint than others. By selection, exchange and collection of seeds from a great many

districts we have now growing at the experimental farm six varieties which are all distinct, not so easily separated by the botanist, because they are much alike in important structural characters; but to the agriculturist they are all distinguishable either from the lateness of the season at which they flower, the leaves, or the thickness of the bottom growth. Some of the Manitoba forms have very few stems and one of the forms found growing wild at Glacier in the Rocky Mountains is exceedingly leafy. As a lawn grass for general purposes this is the most valuable form I have ever seen.

#### THE HARD FESCUE

Is a grass which closely resembles Sheep's Fescue, which is invariably recommended in seed catalogues for growing in high sheep pastures. From our experiments and from correspondence, I have found that Hard Fescue produces more hay and is a more valuable grass than most of the several varieties of Sheep's Fescue of which we have been able to obtain plants or seeds. Closely resembling the Hard Fescue is the Red Fescue, and the chief difference between the two forms is that Red Fescue has underground shoots by which it spreads from the roots.

#### OLCOTT'S RED FESCUE.

Of all the different varieties which we have grown or imported, there is one called Olcott's Red Fescue No. 1, which was discovered by Mr. J. B. Olcott, a well-known specialist in grasses living in South Manchester, Connecticut. He has separated this from a great many hundred different kinds, and it is certainly the most remarkable form of this species for lawn purposes I have ever seen.

Some years ago Mr. Olcott sent me a little sod which I divided carefully and I have now two splendid beds of it. I have also a plot grown from seed which comes true to the variety. It is a very deep rich green, with long fine hair-like leaves, and is perfectly hardy. It is a most valuable grass for lawns and far exceeds in this respect any of the other forms of Red Fescue, I know. There is a great difference in the various varieties, and there is almost as much variation in some of these wild grasses as among the cultivated forms. I mention this grass now because I have a small quantity of seed to spare, and I shall be glad to give it to any one who is especially interested in lawn grasses.

#### COCK'S FOOT GRASS.

*By Mr. Burnett :*

Q. Have you had any experience with Cock's foot?

A. Yes, we grow it every year. It is an excellent grass, exceedingly succulent, a heavy cropper and tolerably hardy. It likes a deep soil and is a rather heavy feeder. It is also a very hardy grass in the way of resisting drought, staying in the land for years if only it once gets a good start. There is sometimes difficulty in getting the young plants through the first winter. It is very much like Alfalfa in that respect. I have tried it on several different plots at the experimental farm and found some difficulty in getting it to take well. It is exceedingly quick in recovering after cutting, shooting up two or three inches in a night after a rain. It is an early grass and is ready to cut by June 20, and should be cut early. This grass particularly requires early cutting, much more so than other grasses because it is apt to get woody and hard, when cattle will not eat it. It is the same grass as we call Orchard grass in this country.

*By Mr. Sproule :*

Q. How much do you use of this Olcott's Red Fescue?

A. The seed is not in the market at all. It cannot be bought, I have a few ounces of it which I shall be glad to give to any one.



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## RECIPE FOR PASTURE MIXTURE.

I mentioned the experimental farm pasture mixture, last week, which has given us such good results of all the mixtures we have tried for several years. I have been requested to give again the composition of this mixture. It is 6 pounds of Timothy, 4 pounds of Meadow Fescue, 2 pounds of Orchard grass, 1 pound of Red Top, and 1 pound of June grass. With this mixture 8 pounds of clover, 2 of Alsike, 2 of Alfalfa, 2 of White Dutch, 1 of Common red and 1 of Mammoth red. That is the best mixture we have tested.

*By the Chairman :*

Q. That is for permanent pasture ?

A. Yes, for permanent pasture.

## NOXIOUS WEEDS.

The other subject I have been asked to speak on to-day is weeds. I have just been speaking of plants which may, perhaps, be called the most useful. The next part of my address will deal with the most useless of plants viz., Weeds.

This question of weeds is of importance to all of us in every part of the Dominion. There is no farm that is worth using which will not, unless watched carefully all the time, produce a great many weeds. The fact that a farm is found to be weedy must not always be taken as irrefutable evidence at any rate that the man farming it is a bad farmer. Allowing a farm to remain weedy may be taken as evidence that bad farming is practised, but a farm that is found to be weedy by a new occupant requires sometimes a great deal of cleaning before it is fit to use, and it may even be a question, especially on a rented farm, whether it is worth while hiring a farm at all, which is so weedy that it will cost more to check or clear off the weeds than the crop will pay back. There are actually some farms as bad as this in Canada. But when a man runs his own farm he takes more interest in it and keeps his land clean, for there is no doubt that all weeds can be eradicated and the land cleaned of these enemies if the nature of the different kinds is understood and a persistent warfare against them is kept up. This statement is made after many opportunities of seeing farms in some of the weediest districts of Canada, which have been cleaned by the farmers working hard, and particularly when they do so with a knowledge of the nature of the plants they are fighting against.

Now, all the plants classed under the one word 'Weeds' have their own special natures, and in making up a list of the hundred worst weeds, few people would include all the same kinds, for there are several which some people would think should be included from their obnoxious characteristics in certain localities which in other places are hardly known. However, there are about twenty weeds in every district which cause much loss to farmers, and the nature of these should be understood by all. What is actually the worst weed in any district is a very indefinite term, and usually the plant stigmatized as the very worst weed is simply the one which has given the individual farmer spoken to the most trouble at a recent date. I made a list some time ago of all the plants, which, according to the statements of farmers, were the very worst weeds, and found that on that list there were no less than twenty-three kinds.

## STINK WEED.

To give an instance of this: In Manitoba undoubtedly the worst weed, from the loss it occasions in many ways, is the Stink Weed, also called Penny Cress, and 'French weed.' This was mentioned in last year's report of this committee. It is a most persistent nauseous weed, has thoroughly established itself, and it has shown that it has more power of resistance to all the ordinary methods of cleaning land than perhaps any other weed farmers of the west have to contend with. So much

indeed is this the case that many intelligent farmers will tell you to-day that it is absolutely impossible to get it out of land which has become thoroughly infested. This weed is so abundant about Winnipeg and in the rich lands along the Red River Valley that in the early spring the whole country seems to be covered by a deep green velvety carpet, and yet in that very district some of the farms are kept clean by good farmers who do not believe that it is impossible for any weed to be exterminated if they only go the right way about it. Now this, I believe, all things considered, is the worst weed in Canada, and yet around Winnipeg and in other parts of Manitoba where it is worst, there are farms practically clear of it now, which were once thoroughly infested, simply by the farmers understanding its nature and taking the proper steps to keep their farms clear.

#### WILD PRAIRIE ROSE.

In the south-west of Manitoba the worst weed is said to be the Wild Prairie Rose, a beautiful little bush that grows only as high as your hand but bears often half a dozen lovely flowers on it, all open at the same time. It has an extensive system of deep underground woody rootstocks which are difficult to destroy. This fact has gained for it the reputation of being the weed of all others which gives them most trouble, according to the methods of farming which are generally adopted in that district. This was the worst weed all the time they did not know how to get rid of it, but they have learned how it can be controlled, by disk harrowing the land twice at short intervals, after ploughing and now you do not hear so much about it.

When you travel through different sections of the country you find certain weeds increasing and giving trouble owing to the method of farming followed, and these weeds are usually called the worst. Instances of these are Couch grass, which must be fought with shallow ploughing, and Indian hay or Sweet grass, which requires the opposite. It is for every man to find out the weed that causes him most trouble, and I make the statement that there is no weed which cannot be fought successfully if you will study its nature. Of course there are some weeds which are much more difficult to eradicate than others and which seem to be so thoroughly established in different parts of the country that their eradication is a matter of extreme difficulty.

#### THE SOW THISTLE.

For instance, there is the Perennial Sow thistle, now very common all through Quebec, down into New Brunswick and right up into Ontario, which is certainly the worst weed in many districts. It possesses to a superlative degree every characteristic of a bad weed. It is a deep-rooted perennial of rapid and vigorous growth, with many fleshy underground stems, the tip of each of which develops into a strong plant which crowds out the crop amongst which it grows. A single seedling throws out several shoots, so that the first year you have a seedling which, at the end of the season, has spread out in every direction forming a colony of young plants around a central point, each one of which forms a rosette of leaves as big as a tea plate, and then the following spring these spread out and prevent any crop plant from developing beneath their shade. From each of these, later in the season, springs up a tall stem which bears a large number of seeds furnished with copious white down which carries the seed far and wide, each one of which may found a new colony of plants. The down itself is also a cause of inconvenience to threshers by breaking up into particles which get into their eyes and give rise to painful irritation.

This weed was introduced from Europe by accident and has been allowed to spread widely throughout Canada because its noxious nature was not known. It is a very aggressive pest, perhaps worse than the Canada thistle. The Canada thistle is well known and good farmers know they can get it out of their land. Even where the Canada thistle is not so well known, its notoriety has spread before it, and so soon as it is recognized a feeling of panic takes possession of the farmers

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and they say 'this is the worst weed we could have, we will therefore prevent it from establishing itself', and it requires little persuasion to induce every one to attack it. Now I repeat, no weed is so bad but a farmer can get it out of his land if he will understand its nature first and fight it steadily and persistently.

## CLASSIFICATION OF PLANTS.

Plants can be classified very simply under the three heads of annuals or one year plants, biennials or two year plants and perennials or many year plants. With one year plants any method by which the young seedlings are destroyed before producing seed is enough to clear the land. With two year plants the same thing is true, only that the farmer has a longer time to do his work because these plants blossom only the second year and then die. Perennials flower only the second year but the roots live for many years.

*By Mr. Burnett :*

Q. Does not the sow thistle spring from root and seed ?

A. Yes, both. It belongs to the last named order, perennials. Having made a certain amount of growth the first year the flower is produced the second year and then the roots, instead of dying as in the case of two year plants, keep on growing year after year and spread from the root as in the case of the Canada thistle, Perennial Sow thistle, and many others, and these are by far the worst weeds we have to fight against. For the purpose of knowing how to destroy perennial plants they must be classified as those that root near the surface of the ground, like the Ox-eye daisy, and those which go down deeply. The shallow rooted perennials are easily dealt with when you can plough the land. Of course when they take possession of upland or rocky pasture land where it is hard to plough, we must adopt other means of destroying them. Shallow rooted plants in agricultural land are got rid of by ploughing in the hot weather when the roots are thrown up and left lying on the surface where they quickly die for want of water under the withering heat of the sun. With deep rooted plants we have to consider that like all plants and animals, they have to feed. They feed through the roots and leaves. If we know that it is necessary for all plants to feed, any method by which we can prevent their feeding and starve them out is an effectual means of getting rid of them. These are all the elements of botany that the farmer need understand to fight weeds successfully.

## VALUE OF DIFFUSING INFORMATION.

This has been made very patent lately in Manitoba. The provincial government during the last three or four years arranged to have several meetings held and lectures delivered at which all the prevalent weeds were described and the best methods for destroying the different species explained in the various districts visited. In addition a conspicuous and complete exhibit of the weeds of the province has been shown at the Winnipeg summer exhibition for the past two years.

The arrangements for the meetings referred to were as follows:—Competent speakers including the energetic chief clerk of the Department of Agriculture Mr. Hugh McKellar went to districts where farmers' meetings had been advertised, all of which were well attended by farmers who were invited to bring specimens of the weeds troubling them, and other weeds likely to be introduced were taken there. The actual weeds were shown to the farmers, their characters explained and the methods of eradication made plain. The North-west Territories last season adopted the same plan. The government previously published and distributed a bulletin on noxious weeds in which all the different weeds of the district were described. The farmers were invited to attend meetings and a series of twenty meetings were held last Summer; although the meetings were held in July, when the farmers have a good deal to do, the interest was so keen that all of the meetings were crowded. The



Hon. Mr. Bulyea, the Provincial Minister of Agriculture went himself to the meetings and they were very successful. The British Columbia Government has also held two series of meetings during the two past summers all of which were attended by the Deputy Minister of Agriculture, Mr. J. R. Anderson, so that the subject of weeds in the West at any rate, is receiving a great deal of attention, with beneficial results. As a consequence weeds are not by any means as prevalent as they were four or five years ago. The lands had become very badly infested and farmers saw that it was necessary to do something to clear the land. The nature of the different weeds seem now to be understood and farmers are adopting methods to secure their extermination. Never in the history of the country was there such a clean crop of wheat as last season in Manitoba. Generally there is some other influence that militates against the crop, and this year the Hessian Fly, our old enemy in Ontario, appeared in Manitoba and injured the crop to a rather serious extent. The freedom from weeds this year was no doubt largely due to the character of the season. The late spring held back the seeding but the seeds of the weeds were in the land, and these being of hardy, well established plants germinated and then when the seeding was done the cultivation of the land destroyed a lot of weeds. In addition, the method I spoke of last week, of harrowing and cultivating with weeders has become so generally adopted in the west that the value of this very wise and useful operation is recognized by the best farmers and although there are some who do not adopt it, many others do, and most see the benefit of it. At the Agricultural shows and the Summer fairs at Brandon and other places there are always a great many inquiries as to the best implements to use and the sale of light harrows and weeders has been very large indeed in Manitoba in the last few years. All this points to the same moral,—the difficulty of controlling all weeds is made less by understanding the nature of the different kinds we are fighting against. If we understand them the fight is very much more satisfactory because when you get good results you know the reason, and can employ the same method again or tell others of it.

#### OX-EYE DAISY.

*By Mr. McNeill :*

Q. In regard to the Ox-eye Daisy, you said where land can be ploughed the better way is to plough it, but there might be other places where it could not be ploughed. Is there any other mode of eradicating it in such places?

A. I am afraid not for the Ox-eye Daisy. With few exceptions, the application of chemicals is not practicable. This weed has a strong aromatic flavour, and sheep which are the best weeders we have for some plants, do not seem to like this one very much, and I am afraid there is no other mode except rooting it out.

*By Mr. Broder :*

Q. I know of one case where a field was completely covered with Ox-eye Daisies. It was close to my own farm. The owner sent a man in to mow it at a certain time of the year and there was not a vestige of it next spring. For some reason or other it disappeared. I do not know whether it was because it was done at a particular time.

A. It is a perennial, so the cutting would not affect it, but I cannot explain the disappearance. The best remedy where you can plough the land is to seed down with clover and timothy, because the daisy flowers just about the same time as you cut your first crop of hay, so no seeds are formed, and the second crop you cut again just before it seeds; then in ploughing under your clover you destroy the plants which only root near the surface and have no running root-stocks.

Q. This was under my notice every day in Summer, and I cannot understand it.

A. The only thing that suggests itself to me is winter killing.

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Q. There was very little snow and a very severe winter, and the Fall wheat was killed last year in our locality, which may have affected this Ox-eye Daisy.

A. That is the only thing I can suggest, because it is a perennial plant, which usually lives many years.

*By Mr. Rogers :*

Q. Close cropping with sheep is the best thing ?

A. It is, for most weeds.

Q. I have seen farms cleaned in that way.

A. Sheep will keep down many weeds, but I doubt if they will this one.

*By Mr. McNeill :*

Q. Is there any season when you can cut undergrowth when it is less likely to grow than at another season ?

A. No; I do not think so.

Q. I had at my own place two cases of the undergrowth being cut on two occasions; some of this undergrowth which was cut I did not wish to have cut at all, and I thought it would grow up again, but on neither occasion did it grow, although it generally grows very freely ?

## THE CANADA THISTLE.

A. The question of cutting at a certain season has been very much spoken of in regard to the Canada Thistle, and the statement is often made that Canada Thistles, cut at a certain season, will rot or bleed to death. I have cut thistles at different seasons and find it is not a fact. The reason is, that, if a plant is living on something else laid up for it, it will feed on that all the time it lasts. The life history of the Canada Thistle is well known. It makes a small growth the first year; the stem dies down in the winter right to the ground, but is not killed by the winter. It is merely the stems; the underground stems are very much alive. Next season these underground stems or root-stocks throw up many flowering stems, which live at the expense of the food laid up in the underground stems. At any time you cut the plant that season, you will only cut away so much of the growth which has been living on the supply of food in the root-stocks. If the plants were cut two or three times during the season, it would have much more effect than one cutting. As to bleeding to death, there is absolutely nothing in it. The stem will never rot until it is dead. If you can cut it down right to the surface of the ground it will only make the plant throw up one or two more stems from the root. No water is going to get into that stump and rot the root; besides, if you cut late in the month of June, the time usually advised, there is generally at that time very little rain. The only reason for cutting it in June is, that that is the time of the year when the thistle has drawn off the largest amount of the prepared food laid up last year, and it has not yet had time to ripen any seeds, but the plant is not killed, and if you leave it alone then and do not cut down further growth produced later, it is quite possible to do more harm than good. The cutting simply prunes it and if it is a strong plant with plenty of roots it will simply throw up more shoots than the one you have cut off. There may be four or five stems for each one you cut down, and these will produce enough leaf growth in a short time to go on with their business of feeding to lay up food in the root-stalks to supply ample nourishment for the flowering stems of the following season. This is one of the general principles of plant life which we must remember in fighting perennial weeds. If perennial plants root near the surface of the ground, these roots should be turned over and exposed to the air and sun, which will destroy them. If they are deep rooted, we can only destroy them by cutting them off at the top and destroying the leaves that feed on the air, and follow this up by keeping on cutting

them down, thus preventing the leaves from laying up a store of nourishment in the roots.

As to the best time for ploughing, there are two ideas which we must bear in mind. A plant which produces its flowering stems at the expense of material laid up the previous year is at its weakest stage when it has produced flowers but has not had time to lay up another provision of nourishment. The whole object of the active growth of a plant is to produce seeds; it keeps on feeding and laying up nourishment, and directly it has grown to its full growth, its flowers expand and then its business is to ripen these seeds and the food for this is taken out of its own stem; after this the plant keeps on feeding with its leaves, but the distribution of this prepared food is in the opposite direction, viz., down the stems to the root-stocks for the use of the next year's growth. In fighting against deep-rooted perennial weeds such as the Canada Thistle, the plants should be ploughed down either when they are in their weakest condition or later on in the year when from the heat or lack of moisture they have little chance to recover, so that it is a question either of fighting the plant in its weakest condition or when the climatic conditions are strongest against its recovery. In other words, plough when the plant is weak or when the climate is so hot and dry that the plant has no chance to recover. With some plants turning them down deeply at the time of most active growth gives good results, the succulent new growth decaying quickly for lack of air. In the case of Indian hay, which is a very troublesome weed, the two methods which have given the best results are to plough directly before the seeds are ripe, this is in May, because the flowers are produced very early indeed, and towards the end of May the seeds are ripe, or wait until the hot dry summer and then plough it deeply, so that it will dry out and have no chance to recover. It is always a good plan after ploughing down these deep, rooted perennials, if your rotation will allow of it, to sow the land with some thick growing crop which will smother out any late growth which may be produced. Of course in the East root crops which require frequent cultivation will answer, as all the shoots that come up are cut off by the cultivator, and after that the growth of later shoots is prevented by being crowded down by the foliage of the root crops. In the West, where they do not use such a large amount of roots as we do in the East, because they have not enough stock to eat them, these weeds can only be kept down by summer fallowing for the double purpose of holding in soil moisture and cleaning the land of weeds.

*By Mr. Featherston:*

Q. In summer-fallowing you do not mean to say deep ploughing is done?

A. Yes; the ploughing is done tolerably deep and the plough is followed immediately with the harrows so as to dry up the surface and prevent the moisture from evaporating. After the ploughing which should be done in June, the surface is harrowed two or three times to prevent any weeds from ripening seeds.

Q. Keep them down during the months of June, July and August?

A. Undoubtedly, keeping down and destroying all seedlings which may appear and all growth from perennials, so that they never get a chance to recover.

Q. Keeping them from getting food from the sun and air.

A. Yes.

*By Mr. McNeill:*

Q. When would you do the cultivating with the weeder, before the leaves are completely formed?

A. When the wheat blades are about one or two inches high.

Q. And when should thistles be mowed?

A. Just before the full growth, as soon as the flowers open, when they have drawn out the largest amount of food from the stems and have not put anything back from the leaves.



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## STINK WEED—THE USE OF WEEDING HARROWS.

*By Mr. Richardson :*

Q. Have you the Stink Weed in Ontario ?

A. Yes.

Q. To a very large extent ?

A. No; not to a very large extent, but it is found occasionally all over the country. It was introduced from Europe many years ago, and when I say we have it, while it is not abundant, there are probably few places where you could not find it by looking for it.

Q. It is becoming a most prolific weed in Manitoba ?

A. It has so become, I am afraid. Those people who have used the weeders or light harrows have met with great success at Emerson. Have you been down there lately ?

Q. Yes.

A. You will remember, then, how both sides of the valley were overgrown with it; it was just like a green sward. I have seen several clean crops near Emerson where weeders and harrows were used in spring.

Q. Did they give up summer fallowing ?

A. No; they operate the weeders after the grain is well up in the spring. Mr. Fraser, one of the best farmers there, has harrowed a great deal during the last two years. Directly the grain is up, when the weeds are less than an inch high, they run the weeders or light harrows over them and destroy myriads without injuring the wheat. Mr. Young could tell us something about the success of this practice.

Senator YOUNG.—Yes, that is right.

Mr. FLETCHER.—The weeder is a comparatively new implement, somewhat of the same appearance as a hay rake, only with three sets of slender teeth which, instead of hooking forward, slope backwards. When drawn over fields of growing grain these stir up most thoroughly about an inch of the surface of the soil, pulverizing it and leaving it loose, so that you get the advantage of cultivation among the growing crops. They do not tear up the growing grain to any injurious extent, and they cultivate the whole of the weeds, so that on the land that is treated by the weeder you will see in a week a great difference in the crop. As an illustration of the advantage of the use of the weeders, Mr. Nicholl, a progressive farmer of Brandon, reaped thirty bushels of wheat to the acre, while his neighbour had only fifteen bushels on exactly the same kind of land.

*By Mr. Calvert :*

Q. What is the best way to treat mustard ?

A. With a weeder. The weeder keeps down the mustard. Therefore, I say it is far better farming than adopting any method of spraying sulphate of copper or other chemicals over the crop, which, although they will kill the mustard, are expensive and tedious. You can go over thirty or forty acres per day with a weeder.

*By Mr. Featherston :*

Q. The weeders are very wide, are they ?

A. They hitch two loosely together, and use two teams of horses. I have tried to get some implement maker to make a sulky weeder, with wheels and a crank to raise the teeth to clear it like a hay rake.

## CROP VALUE ENHANCED BY WEEDING.

Q. Massey's have a sulky weeder now ?

A. They had not last year, they were one of the very firms I wrote to and asked them if they could produce one. I believe the salvation of the West is really

to be found in this weeder question alone; I have seen such remarkable results from harrowing and weeding. The advantage is not only in the increase of grain reaped, but also in the absence of weed seeds from the grain. It is a business matter. A man who is buying wheat looks at the sample. He sees it is a good sample, but if he finds the seed of weeds in it he says 'It is pretty weedy isn't it?' As a matter of business he tries to buy at the lowest figure and will take advantage of any excuse to reduce the price he offers. The farmer will get better prices with less trouble in handling it when his wheat is free from weed seeds, and the whole country will derive a benefit. The use of weeders is, I believe, better farming than spraying and of greater value to the crop than any other method suggested as a substitute. I spoke at some length on this subject last week, so I will not delay the committee longer now.

*By Mr. Featherston*

Q. I have tried the harrow and found that it never hurt the crop; a big heavy diamond harrow?

A. Yes. An argument in favour of harrowing is the well recognised benefit that operation is to a crop of Indian corn. Is there a man in the country, to-day, who does not harrow his corn after it is up? Some years ago, if any man had harrowed his corn people would have said he was crazy, but to-day they would be more apt to say it of the man who did not harrow his corn.

*By Mr. Richardson :*

Q. Of course the harrow won't do in rocky land?

A. No; the method is particularly applicable in the West, where the land is light and free from stones; but in some of that wild rose country I referred to, they have had good effects from using the weeder, notwithstanding the bother given by the woody roots of the roses.

*By Mr. Bell (Addington) :*

Q. You cannot harrow any land in crop that has rolling stones on it?

A. Certainly not.

#### RIB GRASS.

*By Mr. Erb :*

Q. I would like to ask if anything could be done for the Rib Grass in pastures; that is, permanent pastures that you don't want to plough up?

A. Yes, I understand. I don't think there is anything you can do. Of course sheep like the plant. It is a perennial plant which roots close to the surface, and if ploughed down and the land reseeded, it would be clean for some time. That is the only treatment I can suggest. The seed of this plant is generally introduced in clover seed, and I am afraid it is spreading in the country through that means. You find the seed quoted for sale in many of the English and French catalogues, where it is advertised as a crop for sheep, and these animals certainly like it; it is a troublesome weed, however, where clover is grown for seed.

*By Mr. Cochrane :*

Q. Is it not a fact that the seed of the Ox-eye Daisy will lie in the land for a number of years and not germinate?

A. I do not know that about the Ox-eye Daisy, but I know it is true in regard to mustard.

Q. I know if you have a field with Ox-eye Daisy in it, and cultivate it even with corn, and then seed it down, you will have Ox-eye Daisy again. I know as a fact that where the seed of the Ox-eye Daisy had got into a field and it was planted

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with corn, that the corn kept perfectly clean and then another crop was seeded down and the Ox-eye Daisy appeared, much to my surprise, in the field.

A. The seeds do probably remain in the land for some years, but the method of cleaning land by sowing with clover and timothy is very good, and farmers have told me that it has given good results.

Q. And then the sod broken up after the crop is cut?

A. Yes.

## LEGISLATION ON WEED CLEANING.

*By Mr. Rogers :*

Q. Do you think that the present legislation on weeds is strict enough?

A. Well, I think so; but it is not often enforced. When we find the present legislation is enforced, we can talk about new legislation. I am told by weed Inspectors that it is very unpleasant work for a weed inspector to have to go round to some farmer neighbour and tell him that certain weeds need to be cleaned off his land. This farmer says, as a rule, 'Yes, I intend to get them out, but we have been very busy.' Then the inspector goes back in a week or so and finds the work not done, but the farmer says he has been very much rushed and he is going to get the weeds out next week. So long as a man says he is going to attend to it, what is the weed Inspector to do?

Q. They have an Inspector in Manitoba?

A. Yes, but there the conditions are different; practically the crop of the whole country is wheat and farmers seemed to realize that the eradication of weeds was an important matter which all must attend to; and then another thing is, summer-fallowing is regularly practised by the best farmers; besides this there are fewer fences and fewer public roads—from which weeds spread—so that it is not quite so difficult to keep weeds under. Again in the North-west Territories they have a very strict law and it is well observed, for public opinion makes it even easier to do so there than in Manitoba.

The CHAIRMAN.—We have a very strict law in Ontario against the Canada Thistle that has been on the statute book twenty years, and where has it been carried out?

A. In very few places, I fear.

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Having read over the transcript of my evidence of March 1 and March 7, I find the same to be correct.

JAMES FLETCHER,

*Entomologist and Botanist to the*

*Dominion Experimental Farms.*





## SOIL CULTURE, CEREALS AND FRUITS

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
Wednesday, March 21, 1900.

The Select Standing Committee on Agriculture and Colonization met here this morning at 10.30, Mr. McMillan, Chairman, presiding.

By request of the Committee, Professor Wm. Saunders, Director of the Dominion experimental farms, was present and gave the following evidence:—

MR. CHAIRMAN AND GENTLEMEN,—It affords me very much gratification to have the opportunity of again coming before you and reporting on some of the work which has been carried on during the past season at the experimental farms.

### BENEFITS OF THE PLOUGHING UNDER OF GREEN CLOVER.

Last year I submitted to you the results of some of the tests made with the ploughing under of clover, showing the beneficial effect to the subsequent crop by the ploughing under of green clover. In 1897 eight plots of one-tenth of an acre each were laid out at the Central Farm, four of which were sown with grain and seeded with clover in the proportion of ten pounds per acre, and the other four were sown with grain without clover. After these plots were harvested, the clover grew very vigorously, and by the end of October on those four plots which had been sown with clover, there was a heavy growth of clover to plow under. The other plots on which no clover was sown were treated similarly to those on which clover was used. The cultivation, soil and treatment were the same. The duplicate plots in each case were sown with the same kind of grain, so that the test was in every way a fair one. In 1898 the whole of these plots were sown with one variety of grain, Banner oats.

### INCREASE IN GRAIN AND STRAW.

I reported to you last year that the results of that sowing were such as to demonstrate in a very clear and marked way the great benefit of the ploughing under of clover, there was a great difference in the height of the grain and in its vigour of growth. One could see exactly the area that had been covered with clover by the stronger growth on these plots, and this unusual vigour was manifested right up to the time of harvest, when it was found that the average product of the plots so treated was eleven bushels and one pound per acre more than the average of those plots where no clover had been sown. This was an increase of 28 per cent in the grain. There was also an increase of 78 per cent in the weight of the straw. Experiments were conducted this year to try and find out whether the effects of the clover would last longer than one year. These plots were all ploughed towards the end of the season and after thorough cultivation in the spring, they were sown with Mensury barley. During the summer, when the crop was growing, it was still quite easy to discover the lines that had been occupied by the plots where clover had been growing, in the greater vigour of the barley, although it was not so manifest as it was in the first year when the oats were growing. The result was that while the increase

in the grain in the oat plots had been 28 per cent, the increase in the barley in the second year was 29 per cent, and the gain in the straw was 35 per cent. This shows that the effect of the clover was very beneficial at least up to the end of the second year, and as far as its effect upon the grain was concerned it was fully equal to that of the first year. The straw, however, did not increase to the same extent. In the first year the yield of the four plots which had been sown with clover, gave in straw 78 per cent more than the four plots that had no clover, whereas this past year the increase of straw in the case of barley was only 35 per cent. The point I wish to emphasize is, that the effect of clover upon the grain the second year has been equal to what it was the first year. As the presence of a good supply of nitrogen in the soil tends to an increase in straw, we would expect this part of the crop would be relatively less the second year, but it was a surprise to find that the effect of the clover was so well maintained the second year in regard to the production of grain.

#### COMPARATIVE TRIALS OF GREEN MANURES.

Another set of experiments was tried during the season with clover. In a field of four acres of oats, there were two acres which had barley the previous year sown with clover, 10 pounds of seed per acre, and the clover had been ploughed under. There was half an acre after pasture grasses where clover had not been used, and another half acre after pasture grasses with clover, and one acre after a crop of Brome grass. These were ploughed under and the field was sown last spring with one variety of oats which were sown on the same day. The results were as follows: The acre after Brome grass gave 33 bushels and 8 pounds; the half acre after pasture grass without clover gave 36 bushels 16 pounds; the half acre after pasture grass with clover gave 46 bushels 4 pounds, and the two acres after barley with clover ploughed under gave 43 bushels 25 pounds. These results show that where clover was ploughed under, either after barley or when grown with pasture grass, the difference averaged 10 bushels of oats per acre in favour of the land that had been treated with clover, on the whole area of four acres.

#### GREEN CLOVER AS A MANURE FOR POTATOES.

In another field where potatoes had been planted and a portion of the space occupied by them had been sown with clover, and another portion alongside had not been sown with clover, the increased vigour of growth of the vines after clover of which there were six rows was quite remarkable, when compared with the six rows alongside which had been cropped without clover; the plants were much larger and healthier and retained their foliage longer. When the crop was dug there was found to be a difference of 28 per cent in the weight of potatoes in favour of the land where the clover had been used.

I do not think, gentlemen, there is any subject at the present time that is more important to the farmers of the Dominion than this one of the ploughing under of green clover to influence and increase the subsequent crops. As we all know, the farming community are a little difficult to move in such matters; but when once they feel sure of their ground they are quite ready to adopt any practice which will be to their advantage; the chief difficulty with all such subjects is to bring them under the notice of farmers. I think we cannot give too much prominence at the present time to this important subject, the ploughing under of clover. The cost of sowing clover with an acre of grain is so little that almost any farmer when once convinced of the benefit of the practice will resort to it. 10 lbs. to the acre is the quantity we have recommended, and this quantity has been found very satisfactory. The cost of the clover seed will not probably average more than 80 to 90 cents per acre, and as the seeding is done at the same time as the grain it is sown without extra cost.



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*By Mr. Rogers :*

Q. What was the nature of the soil on which you made these experiments ?

A. The soil of the 8 plots to which I referred is a mixed sandy and clay loam, the sand predominating, and the four acres referred to in the other experiment had a dark sandy loam without any appreciable amount of clay.

Q. Have you tried it on clay ?

A. Yes, we have tried the sowing of clover with grain on clay soil and it works very well. We had some 10 acres last year ploughed under of such land.

Q. The trouble is to get a good growth the first year in a clay soil ?

A. We have not found any difficulty on the Experimental Farm, but none of our land would be regarded as very heavy clay.

*By Mr. Sproule :*

Q. When was this clover ploughed under ? about what time of the year ?

A. About the middle of October.

Q. The year it was seeded down ?

A. Yes, the same year.

Q. In both cases ?

A. Yes, in all cases.

*By Mr. Erb :*

Q. Was it pastured ?

A. No, sir. It was not convenient to pasture this land, but we invariably recommend farmers to pasture such clover crops in the autumn if they can, because it is more profitable to do so.

Q. The pasture would pay for the seed ?

A. I have met with a number of farmers during the past season who have adopted this plan and they have found the results to be very satisfactory. In my recent visit to Nova Scotia I met several farmers who have adopted this practice, and they are so thoroughly convinced of its value that they are going into it on a large scale.

#### PLOUGHING UNDER OF OTHER GREEN CROPS.

*By Mr. Featherston :*

Q. Have you made any experiments with the ploughing under of such crops as rye ?

A. Yes, but we have made no comparative tests of it alongside of clover. I may say that all green crops ploughed under, improve the land for crop the year following, but rye does not improve it in so marked a way as clover does.

Q. I noticed a farmer ploughed rye 5 or 6 feet high into his orchard, and I observed that his orchard is improving all the time ?

A. All green crops used for this purpose are of value when ploughed under, as they convert during their growth more or less food existing in the soil in unavailable forms into available plant food, and this is stored up in their substance and gives a large amount of food which can be easily appropriated by the next crop, which will add very much to its vigour and productiveness.

*By Mr. Cargill :*

Q. Did you succeed in getting a good crop of clover here ?

A. Yes, sir.

*By Mr. Sproule :*

Q. You have sown clover with oats as well as barley and wheat.

A. Yes, with oats, barley and wheat.

*By Mr. Rogers :*

Q. How much grain do you sow to the acre?

A. Usually 2 bushels of oats or barley and  $1\frac{1}{2}$  bushels of wheat; sometimes, when the oats are short and thick,  $1\frac{1}{2}$  bushels is sufficient. We find that clover does very well with either barley, oats or wheat. Of course the oats if their growth is very strong are more likely to smother some of the clover plants, but we have not found any practical difficulty in this respect on the Central Farm.

*By Mr. Cargill :*

Q. How much clover did you say you used to the acre?

A. 10 lbs. of red clover.

*By Mr. Featherston :*

Q. You have never had a dry season here in Ottawa as we have in the west?

A. No, we seldom suffer from very dry weather.

*By Senator Perley :*

Q. How would white clover do?

A. The white clover would not give as good results; the growth is not so heavy and I think the seed is quite as expensive as the red. I believe the red clover would be much the more economical of the two. In previous experiments which we have tried with clover we have found that the roots penetrate very deep; within a year from the date of sowing we have found roots more than 4 feet below the surface.

*By Mr. Rogers :*

Q. Will it not root deeper if it is not pastured?

A. It is quite probable that the roots would strike deeper into the soil if the clover was allowed to reach its maximum growth without disturbance.

I would next call the attention of the committee to some of the results we have had during the past year with the use of special fertilizers on crops.

Q. Do the deep roots of the clover add to its value?

A. The clover roots which go down very deep into the soil, bring up from those depths quantities of plant food such as phosphoric acid and potash which are stored in the upper portions of the plants and when ploughed under are left within reach of such shallow-rooted crops as barley or wheat, so that clover may be regarded as an enricher of the soil in these elements also, since it brings them up from depths which other crops cannot reach.

*By Mr. Erb :*

Q. I have no reason to think but that clover will enrich the soil, but don't you think that if followed for a number of years the farmer's land will become more dirty with weeds?

A. No, I think not. We have found that after the grain harvest is over the growth of the clover is made so quickly that it smothers out a large part of the weeds that would otherwise grow, and we have found a smaller proportion of weeds in the clover plots than we have found in the soil where the land is sown with grain without clover.

There is another point to which I had not referred and which is a very important one, and that is the value of the clover as a catch crop during the latter part of the season, when it takes up all the fertilizing material that comes down in the rains a large part of which would otherwise be lost in the drainage waters.

Q. In our soil as a rule clover does not make such a heavy growth as to smother out the weeds, and if there are weeds such as the ragweed for instance, it would be likely to go to seed?

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A. In such case the farmer should cut such strong growing weeds and thus prevent them going to seed. I am not urging clover as a remedy for weeds. The question was asked if the land so treated would not get covered with weeds, and in our experience we have found such land to be less weedy than it would have been if allowed to stand without a crop after the grain harvest in the autumn. The average growth of clover with us has been from ten to twelve inches, and it usually grows strong enough to smother out most other weeds. It would not probably affect the ragweed materially, as that is so strongly rooted as to flourish under difficulties.

*By Mr. Featherston :*

Q. The idea of Mr. Erb, I think, is that if it was not seeded down you would cultivate the land after the harvest, and that would keep down the weeds.

A. In all these cases we must leave the intelligent farmer to use his best judgment. It would be better, if it was necessary to kill the weeds first, to defer the seeding of clover until the following year and cultivate the ground in the meantime.

*By Mr. Sproule :*

Q. Did you ever try sowing clover on land you intended to sow turnips in and allow it to remain until the following spring, and then plough it under as manure?

A. We have not tried that yet, but experiments have been planned along that line for next year.

## EXPERIMENTS WITH BARN-YARD MANURE, ROTTED AND FRESH.

Last year I mentioned to the committee that we had carried on experiments with barn-yard manure, rotted and fresh, applying it to crops every year for ten and eleven years. It has been thought wise to change that experiment and endeavour now to get some information as to how long the effects of these ten applications of manure will last in the soil, and that is the point I wish to refer to next. The plots which have received the ten or eleven applications of barn-yard manure were left last year without manure; otherwise, they have been treated the same as the other plots. The wheat plots on which rotted manure has been used averaged for the eleven years 20 bushels and 56 pounds, while those to which fresh manure has been applied have given 20 bushels 52 pounds per acre. That does not, however, include the results of last year.

*By Mr. Featherston :*

Q. You are now comparing the rotted manure with the fresh?

A. Yes.

*By the Chairman :*

Q. What were the quantities used?

A. Twelve tons to the acre.

*By Mr. Perley :*

Q. How do you measure that?

A. We weighed it. The plots are one-tenth part of an acre, and we weighed and applied 2,400 pounds, which is the one-tenth part of 12 tons.

*By Mr. Erb :*

Q. Twelve tons each year?

A. Yes, for eleven years. In 1899 the manure was discontinued, and the crop was 23 bushels 40 pounds from rotted manure and 27 bushels 40 pounds from fresh manure.



*By Mr. Featherston :*

Q. Was that fresh manure applied to the same plot each year?

A. The results I am giving you now are those of the first year after the manure has been discontinued.

*By Mr. Cargill :*

Q. That is with the same crops?

A. Yes, the same crops; so that while during the eleven years which rotted manure has been applied to one plot it has averaged 20 bushels 56 pounds; the same land this year without any additional manure gave 23 bushels 40 pounds, and the plot which had been treated for the same period with fresh manure gave an average of 20 bushels 52 pounds per acre, while this year, after the manure had been discontinued, the yield has been 27 bushels 40 pounds per acre.

*By Mr. Featherston :*

Q. They were about equal up to last year. I mean the plots that were treated with fresh and rotted manure?

A. Yes, there was only four pounds per acre difference in favour of the rotted manure up to last year.

Q. And this year the crop is altogether in favour of the fresh manure?

A. Yes, to the extent of four bushels per acre.

#### LOSS IN WEIGHT BY ROTTING MANURE.

*By Mr. Lang :*

Q. Was the manure weighed after rotting?

A. Yes.

Q. There would be a great deal more bulk of rotted than fresh?

A. I think the same bulk of rotted would be the heavier.

Q. It would be the bulkier?

A. I should expect it would pack closer. I have brought before the committee several times the subject of the loss in weight there is in rotting manure. You take 2,000 pounds of manure and rot it, and in less than three months you will have less than 1,000 pounds in weight. The point I have been trying to gain information on during these eleven or twelve years has been, what would be the relative value of equal weights of rotted and fresh manure when applied to the more important farm crops. That is the practical point in all these investigations, and to my mind it is a very important one.

*By Mr. Featherston :*

Q. You really lost one-half in the weight of the manure by rotting?

A. Yes, fully that.

*By Mr. Hurley :*

Q. That depends upon whether there is a great deal of straw there?

A. With the usual proportion of straw it loses fully one-half. There was an increase last year in the grain in nearly all the wheat plots and an increase also in the straw. While the straw from the rotted manure plot has given 3,544 pounds per acre as the average for the eleven years, last year it gave 3,860 pounds, and the straw from the fresh manure, which had given an average of 3,598 pounds during the previous eleven years, gave last year 4,550 pounds, the increase in the straw being larger where the fresh manure was used. That is a point in the experiments which has not been mentioned before.

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*By Mr. Featherston :*

Q. That is a good point too.

*By Mr. Erb :*

Q. In applying the rotted and fresh manure, you used the same quantities by weight in each case?

A. Yes, sir.

Q. Still, your experience has been that a certain quantity of fresh manure when rotted will lose half its weight?

A. That is correct. I wish to explain here that in rotting the manure for these experiments, the plan adopted has been that which is commonly followed by farmers, namely, composting it in the barnyard without any cover. We have found by careful chemical treatment—the Chemist at the Experimental Farm has reported on this—that you can rot the manure in absolutely tight vessels and with other proper conditions as to cover and moisture, without wasting any very large part of the fertilizing constituents. But these conditions are not practicable for the ordinary farmer, and it is better to present such results as are had from following the usual farm practice.

*By Mr. Featherston :*

Q. But you found the same difference in weights when the manure was rotted in that way?

A. Yes, and there is a loss of valuable constituents, but not nearly as much as there is when the manure is exposed and rotted on the ground in the ordinary way.

*By Mr. Erb :*

Q. Have you ever conducted experiments taking a certain weight of green manure and then taking the equivalent of that manure in the rotted form and see the difference?

A. We have not tried the experiment in that way. I do not think it would appear more conclusive than trying it the other way, that is taking equal weights of rotted and fresh manure as we have done in the experiments reported on.

Q. But I think you would show what a farmer would lose by allowing his manure to rot?

A. It seems to me that is shown as clearly the other way.

Q. The statement is made alongside of it that in rotting the manure it loses about one-half in weight?

A. Yes, that has usually been done.

*By Mr. Macdonald (Huron) :*

Q. What is the reason of that decrease, the elimination of water?

A. A large part of the decrease in weight is due to loss of water. There is also a loss of the fertilizing constituents which can be determined by chemical analysis, and besides this there is a considerable loss in organic matter through the decomposition of the fibre, straw, and other solid materials in the manure, and during this decomposition carbonic acid gas is given off.

Q. There would not be very much weight in the carbonic acid gas?

A. Yes, this is a heavy gas, a compound of carbon and oxygen.

Q. Would that make the difference?

A. I think so. That process of decomposition, as far as it goes, is much the same in character as combustion, only less complete.

Q. Have you as much water in the rotted manure as in the green?

A. Usually about the same proportion.

Q. It is really a very difficult thing to see how 100 pounds of green manure will lose 50 pounds by rotting.

A. The fermentation is a wasteful process.

Q. What does the weight that is lost consist of?

A. Chiefly water and carbonic acid gas.

Q. That will be one of the plant foods?

A. While this is not a plant food in the ordinary sense, it is absorbed by plants and converted into woody tissue. Plants take this in through the leaves.

Q. You regard 50 pounds of rotten manure as equivalent to 100 pounds of green manure?

A. No, it is not more than equal in crop producing power to 50 pounds of fresh manure.

*By the Chairman :*

Q. When fresh manure is put into the soil there is a fermentation goes on which liberates part of the fertilizing elements in that soil on account of that fermentation. This does not take place with the rotted manure.

A. I think that is almost certain. We know that the liberation of plant food is brought about largely by minute organisms which live in the soil and they propagate freely in fermenting manure, and I have no doubt that the fermentation which does take place when fresh manure is turned under is the chief reason why crops can be obtained from a given weight of fresh manure equal to those from the same weight of rotted manure. Further, in the process of rotting the elements of fertility that are in the liquid parts of the manure are largely lost, and these are more valuable pound for pound than the solids, hence the sooner you get the fresh manure into the ground the better, for the soil absorbs everything as the fermentation goes on.

The CHAIRMAN—Are there any other questions to be asked Prof. Saunders?

#### OTHER EXPERIMENTS WITH FERTILIZERS.

Prof. SAUNDERS—I have a little more to bring before you in connection with this question of fertilizers. Last year I expressed the opinion that the artificial fertilizers used in connection with these fertilizer plots were not given a fair chance, for the reason that the humus in the soil was largely exhausted, and the announcement was made that it was proposed to sow clover in 1899 on all these plots and plow that in, mainly with a view to add humus to the soil and thus increasing its power of retaining moisture. In carrying this out there would also be the addition of the fertilizing materials collected by the clover crop, but as clover was to be sown on all the plots all would have an equal advantage. Clover was sown on all these plots. It took very well on most of the plots, except those which had received no fertilizers. There the clover was deficient in height, being only from four to six inches, while in the other plots it varied from ten to twelve or fourteen inches high.

*By Mr. Featherston :*

Q. That was ploughed in the fall?

A. Yes, about the middle of October; and that land is now waiting treatment in the spring, when it will be cut up with a disc harrow and harrowed with a smoothing harrow before sowing. We find the same difficulty as to lack of humus in the root crops and corn crops as we have found with the grain, and, as there is no practicable way of adding humus to these plots so as to have them comparable with what we are doing on the grain except by sowing clover, it has been decided to sow clover on these plots this year and let that clover go over until about the 23rd of May, by which time there will be a large increase of growth, when the clover crop will be still more valuable. For this reason the crops of corn and roots for 1900 will be discontinued on these plots.



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*By Mr. Rogers:*

Q. Is clover which has been killed out in the winter as valuable the next spring as when it is plowed in green in the fall?

A. I don't think it is, although it does not seem possible there can be any very great loss of fertilizing material from freezing. We have had clover crops injured in that way and have cut out square blocks four feet each way and about nine inches deep, and have examined every particle of that soil very carefully, taking out all the roots and tops, and we have found a considerable loss in the weight of the roots as well as of the tops where the killing out occurred; this led me to think that in all probability before we could plow in the spring there had been decay of the roots and a loss of the valuable fertilizing elements they contain through leaching in the soil, and I do not think the crop injured in that way would be equal in fertilizing power to a crop plowed in uninjured.

I have only given you the results we have had with wheat on the manured plots for the past year. I will now give you those had from the barley.

The average for the ten years in barley where the rotted manure has been used was thirty-four bushels, thirty-four and seven-tenth pounds to the acre. Last year when the manure was discontinued this plot gave thirty-four bushels, forty-three pounds, practically the same as the average for the past.

On plot two the fresh manure has given thirty-five bushels, twenty-one and one-tenth pounds as an average for the ten years. Last year this plot yielded thirty-three bushels, forty-six pounds per acre, which is a slight falling off from the average of the past. The weight of the straw also was a little less.

With regard to the tests with oats, ten years gave an average of forty-eight bushels, fourteen pounds from the rotted manure, while last year the yield was fifty-five bushels, thirty-three pounds per acre. The fresh manure has given fifty-four bushels, seventeen pounds as an average for the ten years, and last year we had fifty-five bushels and fifteen pounds, showing a decided increase, although no manure was used. There was, however, a decrease in the weight of the straw.

*By Mr. Featherston:*

Q. I notice in the comparison between spring wheat and barley the difference seems to be in favour of the rotted manure in case of the barley?

A. During the past year when no manure was applied, the barley did best after the rotted manure.

Q. How is that accounted for?

A. That is not easy to explain. The difference, however, is not large, it is a little less than one bushel per acre. In the case of the oats the difference is also a little in favour of the rotted manure, fifteen pounds only to the acre, but the results had from the wheat are decidedly in favour of the fresh manure, to the extent of four bushels per acre.

*By Mr. Sproule:*

Q. For ten consecutive years you applied manure to the same ground and took the average crop of these ten years?

A. Yes.

Q. Then you stopped one year, and after you stopped applying it you had a larger crop than when applying it?

A. In the case of the wheat a little larger, but I attribute that to a more favourable season.

Q. But had you a difference in barley?

A. In that case there was a falling off from the average of previous years.

Q. Would not that seem to indicate that in the case of wheat you had better not manure at all?

A. That conclusion would be scarcely reasonable, the difference has probably been brought about by favourable weather for this crop.

Q. You are going to continue that?

A. Yes, we want to see how long the results of the ten years manuring will influence subsequent crops, and we hope to continue these experiments until we gain some satisfactory information on this point.

As the result of this test for the whole period of twelve years in all, we have had an average crop from the wheat where rotted manure has been used of 21 bushels 10 pounds per acre, while with the fresh manure the yield has been 21 bushels 26 pounds. With barley, covering a period of eleven years, the plot treated with rotted manure has given 34 bushels 35 pounds per acre, while fresh manure has given 35 bushels 14 pounds.

With oats covering a period of eleven years with rotted manure, the average has been 49 bushels 3 pounds; with fresh manure, 54 bushels and 18 pounds.

In the case of the wheat in the twelve years' test, the difference has been 16 pounds per acre in favour of the fresh manure, 27 pounds in the case of the barley in the eleven years' test, and 5 bushels 15 pounds per acre in the oats in the test for eleven years.

The oat is a strong-rooted plant and penetrates deeper in the soil than the barley, and this, perhaps, is the reason for the difference in these two sorts of grain.

*By Mr. Sproule:*

Q. Do you think that experiment in manuring is one that could generally be followed by farmers? They generally manure their fields only once every five years.

A. Oh, no; we do not expect that farmers could follow us in that line, but in order to get information we have to make such experiments very complete, and it was thought that, by making an application of manure each year for a number of years, we should get very conclusive results.

*By Mr. Erb:*

Q. But it seems to me the experiments conducted in that line are not as convincing to the general public as if they were conducted along the lines of putting so much fresh manure and the equivalent of rotted manure and comparing the results. A farmer may have a hundred or two hundred tons of fresh manure. He either applies it fresh or rotted. If he allows it to rot, he cannot be expected to apply the same number of tons as when fresh. Consequently, he will have to manure less heavily to cover the same amount of ground.

A. There might be some advantage in that plan, but it seems to me quite clear if we apply twelve tons of the rotted manure to one field and twelve tons of fresh manure to another, and get equal or better results from the fresh material than we do from the rotted (and publish from time to time the loss of manure that takes place in the rotting process), that it is not difficult to understand.

*By Mr. Featherston:*

Q. Experiments have proven that the man who allows his manure to rot loses a great deal by doing so?

A. Yes.

*By Mr. Gould:*

Q. How in the case of manure that you could not put on the land without rotting on account of seeds? I know that I could not put on any manure from my farm, for I bought a very weedy farm.

A. Would you not apply your manure to a hoed crop?

Q. Even with a hoed crop, I would not put it on.

A. With ordinary weed seeds in the manure, if you apply it for a hoed crop, a few weeds more or less does not matter, as the same hoeing kills them all.

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Q. You take wild oats and wild tares, and if you get them in I am not going to say when you will get them out.

A. I may say that all our results are not expected to be followed strictly by any one. Every man must use his own judgment in all such matters, and if he knows what results we have had, he will be able to adapt our experience to his conditions.

Q. Take the farms in our country that are leased. Every lease contains a very strict clause providing that every bit of manure should be turned and fermented before it is put on the land. We could never keep our farms right unless we did so.

A. I know a good many practical farmers who are putting the manure on fresh, and they found it to be to their advantage to do so as far as this is practicable.

Q. I have no doubt that it is better for the soil and will produce larger crops, but the thing is for us to get our farms clean and keep them clean.

## EXHAUSTION OF SOIL BY CROPS.

*By Mr. McGregor :*

Q. With regard to growing of corn, oats, wheat or barley, have you any way of telling which is the hardest on the land.

A. Corn takes more of the fertilizing constituents from the soil than either wheat, barley or oats. In the case of corn you take off the land a very large crop. Supposing you get twenty tons per acre, cut green for ensilage, if you analyse that you will find that the sum total of the plant food contained in it is greater than that found in an ordinary crop of grain.

Q. Does not the corn take more from the elements for its nourishment?

A. It takes a considerable portion from the air, but it also takes much from the soil. There is an idea abroad that the corn is not an exhaustive crop and that it draws its nourishment chiefly from the air with the aid of sunshine. But this is not entirely correct.

*By Mr. Featherston :*

Q. It is all moonshine.

A. Yes, largely so.

*By Mr. Cargill :*

Q. How does the corn crop compare with the turnip in exhausting the soil?

A. I cannot give you from memory the exact proportion of the elements of fertility taken from the land by these two crops, but I shall be glad to give you these particulars another time.

*By Mr. Featherston :*

Q. Do you not think the potato one of the least exhaustive of crops.

A. I think it is. If you will permit me to defer answering these questions until to-morrow I will give you the exact figures.

## IMPORTANCE OF ADOPTING BEST METHODS OF SAVING AND USING MANURE.

I was going on to say that it is estimated that the manure in solids and liquids produced by farm animals in Canada is about 100,000,000 tons per annum, and each ton of this valuable fertilizer if properly saved may be safely placed at \$1, which gives us a total value of 100 million dollars. If all this manure was carefully handled, preserving the liquids with the solids in tight troughs behind the animals, using sufficient straw as an absorbant and distributed over the land in a fresh condition, the saving effected would be very large as the value of this manure in bringing



increased crops would probably be nearly double what it now is. This is a very large item in the economy of farm management in Canada which should be carefully considered by every practical farmer. It is a subject which is attracting at the present time the attention of the leading agriculturists in many parts of the United States as well as in this country. Last August I had the honour of bringing this subject prominently before the Society for the Promotion of Scientific Agriculture which met in Columbus, Ohio, at the meeting of the A.A.A.S. The results obtained from the experiments conducted at the Central Farm were presented on that occasion in a paper dealing with all the more important facts. A large number of the leading agriculturists of the United States were present. The number which took part in the subsequent discussion on this subject showed the keen interest awakened in the question.

During the past two weeks an animated discussion has been conducted by prominent writers in the *New York Tribune* and the *Commercial Gazette* of Cincinnati; in each case the letters have called attention to the great value of the work carried on in this line at the Ottawa Experimental Farm and quotations have made from our reports in support of some of the arguments advanced. One of the writers remarked that 'the article in the Report of the Experimental Farms for 1894 is admirable.' That was the year when we called attention first to the great loss of weight in the rotting of barnyard manure.

Another prominent man writing personally to me says: 'Your station has given this very important subject careful study. I think you deserve high credit for the work you have done.' It is gratifying to see these leading authorities in the United States acknowledging so freely the usefulness and the thoroughness of the work done in Canada.

*By Mr. McGregor :*

Q. Taking all these results, I would say that farmers that can put their cattle into large loose boxes with floors that will not allow the liquid manure to escape can keep the manure in the best condition.

A. The tramping of manure by cattle is, I believe, attended with good results. We have not had many opportunities for experiment in that direction, but I am satisfied from the results which have been obtained in Germany and elsewhere that manure loses much less of its valuable constituents when prepared by the tramping of cattle than in any other way.

Q. It absorbs the liquid, which makes it more valuable ?

A. Yes.

*By Mr. Sproule :*

Q. You would want a cement floor so that it would retain the liquids, or a floor made impervious to soakage by being covered with clay ?

*By the Chairman :*

Q. We have large box stalls with cement floors ?

A. Such an arrangement is an excellent one. There are times when you cannot get the fresh manure on the land, and I believe there is no better way than this of preserving it.

*By Mr. Rogers :*

Q. Is it not better to have the straw cut when you want to have the manure fresh ?

A. Yes.

Q. Long manure is very hard to work into the soil ?

A. Yes, it is.

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## EARLY, MEDIUM AND LATE SOWING OF GRAIN.

With your permission I will now refer to the subject of the early, medium and late sowing of grain.

We have been carrying on, as most of you know, for the last ten years experiments along this line. A piece of land has been set aside for the purpose, consisting of forty eight plots of one-tenth of an acre each. Eight of these have been sown as follows: two with barley, two with wheat, two with oats and two with pease, and these have been sown at the very earliest time seed could be put in the ground. Another series was sown at the end of a week, a third at the end of another week and so on for six sowings. These plots have all been harvested and threshed separately every year, and, as this work has now been continued for ten years with the grain and five with the pease, the average of the results may be taken as fairly reliable.

The results show as follows: with oats the second sowing has given the best results. Beyond this, delay in sowing involves losses in crop as follows: You will understand that the second sowing would be a week after it was just possible to get on the land to put the grain in. The first sown plots have always been at a disadvantage because the land was not quite fit; and another reason is that we are subject in Ottawa to wind storms at that period, which blow a good deal of sand about which injures the very early crop. A week of delay beyond the time named gives an average loss in the case of oats of 15 per cent, a delay of two weeks 22 per cent, three weeks, more than 32 per cent, and a delay of four weeks involves a loss of 48 per cent.

*By Mr. Cargill:*

Q. The second sowing would be an increase?

A. The second sowing has given the best results.

*By Mr. Featherston:*

Q. What is the comparison of the first and second week?

A. In the case of the oats the first sowing has given an average crop for ten years of 53 bushels 9 pounds, the second sowing 59 bushels 18 pounds. Barley, first sowing 38 bushels 21 pounds, second sowing, 44 bushels 9 pounds. Wheat, first sowing 17 bushels 59 pounds, second sowing 20 bushels 30 pounds; and pease, first sowing 30 bushels 26 pounds, second sowing, 33 bushels 57 pounds.

*By Mr. Cargill:*

Q. I understood you to say that the second sowing had given you an increase of 15 per cent over the first.

A. I fear you have misunderstood me. I was not giving the figures of difference between the results from the first and second sowing but the results of delaying a week beyond the second sowing. The second sowing is made a week after it is possible to get on the land, and the practice I am advocating is that as far as it is possible, all grain crops should be sown within ten days from the time when you can get on the land. In barley, a delay of one week beyond the second sowing causes a loss of 23 per cent, two weeks a loss of 27 per cent, a delay of three weeks a loss of 40 per cent, and a delay of four weeks a loss of 46 per cent. If the season opens early, it is not uncommon to find farmers sowing grain until a very late period. In spring wheat the loss is still greater, a delay of one week beyond the time named involves a loss of over 30 per cent, of two weeks a loss of 40 per cent, three weeks a loss of 50 per cent, and four weeks a loss of 56 per cent.

*By Mr. Rogers:*

Q. These experiments are only for the farm here?

A. These results have been had at the Central Farm in Ottawa and may be taken as a guide by the farmers of Ontario and Quebec. On the experimental farms in the

west where so much depends on the conditions of moisture, the results are very contradictory. The crops had at the experimental farm for the maritime provinces follow ours very closely except that it does not seem quite so important to get the grain in very early there; but the sowing of grain in these provinces should be finished within fourteen days after the season opens, to give the best results.

*By Mr. Featherston:*

Q. You mean the season opens earlier there?

A. Yes; a little earlier, and the spring season is longer. Peas have been tested for five years, and the following results have been had. The second sowing has given the best results, beyond that, a delay of one week has resulted in a loss of 4 per cent, two weeks 12 per cent, three weeks 22 per cent, and a delay of four weeks has caused a loss of 30 per cent. The lesson taught by these experiments is that in Ontario and Quebec all cereal crops should be in the ground within ten days after the season opens. To accomplish this, the land intended for the spring crops should be ploughed the previous autumn, so that it may be got ready for seeding when spring opens with the least possible delay.

*By Mr. Rogers:*

Q. And if any crop must be late, peas will bear late sowing the best?

A. Yes; but still the loss is from 22 to 30 per cent if sowing is delayed for three or four weeks.

Q. But something must be the last?

A. Yes; that is necessarily so. Spring wheat should be sown first, for the reason that the loss from delay is greater there, and after that barley and oats. The loss, however, from delay in sowing these is pretty nearly the same in each case. Peas have less loss than any other of the four crops named from delay.

*By the Chairman:*

Q. There is another lesson to be taught from this, and that is the importance of having the land underdrained, so as to be able to get on it very early in the spring?

A. Yes, Mr. Chairman, that is a very important point, and one which cannot be too strongly urged, as the draining of land often enables a farmer to get in his crop from ten days to a fortnight earlier.

#### EARLY AND LATE SOWINGS OF ROOTS.

Along this same line, I brought before the committee two years ago the results we had from the sowing of root crops at different periods. We have now tried for five years two periods of sowing, one being two weeks later than the other. The date of the sowings has not been the same each year, for the reason that the seasons vary considerably. In 1895, when we began this experiment, the first sowing of turnips was made on May 11 and the second on June 12. Twelve varieties were sown, and the average gain from early sowing of these twelve varieties was 1 ton 642 pounds per acre that year.

In 1896 the season was a little earlier, and we began on May 8, when the first sowing was made, and the second on May 22. With fourteen varieties which were sown that year the results were in favour of early sowing by an average of 4 tons 1,424 pounds per acre.

In 1897 the earliest sowing was on May 8 and the second sowing on May 21. The gain on the plots early sown for the eighteen varieties tested that year was an average of 3 tons 1,870 pounds per acre over those later sown.

In 1898 the first sowing was on April 28 and the second on May 6, and the gain from early sowing on the nineteen varieties sown that year was 1 ton 488 pounds per acre.



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In 1899 the first sowing was on May 12, and the second sowing on May 26, and the gain of the earlier sowing of the twenty-five varieties tested that year averaged 4 tons, 704 pounds per acre in favour of early sowing. The average gain for the five years named with a number of varieties ranging from twelve to twenty-five has been 3 tons 226 pounds per acre in the case of turnips from the earlier sowings and the first of these sowings have been made between April 28 and May 12, depending upon the season.

With the mangels the results have been very much the same. While there has been a gain in the turnips from early sowing of 3 tons, 226 pounds on the average per acre, the mangels show a gain on the average of 3 tons, 1,251 pounds per acre, being the average of five years. The dates of the sowings were the same as I have given you for the turnips and the number of varieties have ranged from twelve to twenty. The results from early sowings of mangels by years have been as follows:—

Date.		Tons.	Pounds.
1895	Sown May 11; second sowing, May 25; gain from early sowing, average of twelve varieties.....	4	126
1896	First sowing, May 8; second sowing, May 22; gain from early sowing, average of thirteen varieties.....	4	1,890
1897	First sowing, May 8; second sowing, May 21; gain from early sowing, average of eighteen varieties ..	3	452
1898	First sowing, April 28; second, May 5; gain from early sowing, average of eighteen varieties.....	1	1,273
1899	First sowing, May 11; second sowing, May 25; gain from early sowing, average of twenty varieties.....	3	714

With carrots the five years' test have given us a gain from earlier sowing of 2 tons, 972 pounds as an average for the whole time. The results for the several years with the carrots were as follows:—

Date.		Tons.	Pounds.
1895	First sowing, May 11; second sowing, May 25; gain from early sowing, average of twelve varieties .....	4	164
1896	First sowing, May 8; second sowing, May 22; gain from early sowing, average of fourteen varieties ..	2	1,677
1897	First sowing, May 8; second sowing, May 21; gain from early sowing, average of fifteen varieties .....	1	1,443
1898	First sowing, April 28; second, May 6; gain from early sowing, average of sixteen varieties .....	1	563
1899	First sowing, May 11; second, May 25; gain from early sowing, average of twenty varieties.....	2	1,012

The gain from early sowing from the whole period has averaged 2 tons, 972 pounds.

*By Mr. Featherston:*

Q. Have you made any test as to the keeping qualities of turnips between the early and late sowings?

A. We have examined them as to texture and find the early sown a little more stringy than the others, but there does not appear to be any difference in feeding value, and the animals eat both quite readily.

*By Mr. Sproule :*

Q. Don't you think that the early sowing has an advantage over the late sowing on account of the fact that with the early sowing the cold prevents the fly from appearing. We always sow early before the fly comes?

A. I think it would be an advantage where the fly is troublesome. We have not had much trouble on that account here.

*By Mr. Featherston :*

Q. The fly with us occurs from the 5th to the 15th of June?

A. Here again the farmer must adapt his practice to suit the conditions. The results we have had show a considerable gain from early sowing.

Sugar beets we have tried only three years. In 1897 there was a gain, taking the average of the results had at all the farms, of 1 ton 1813 pounds, and in 1899 a gain of 3 tons, 200 pounds in favour of the early sowing.

*By Mr. Sproule :*

Q. Have you the yield of the sugar beet there?

A. The yield per acre of the four varieties of sugar beets which have given the largest crop at all the experimental farms for the three years has been as follows: Danish Improved, 22 tons 28 pounds per acre; Red Top sugar 21 tons, 593 pounds; Wanzleben, 21 tons, 1,975 pounds (this is the variety grown chiefly in Germany for sugar), and Improved Imperial, 20 tons, 1,848 pounds per acre.

Q. Have you the yield of turnips as well?

A. Yes sir. The four years experiments with turnips gives the following six varieties as having done the best, taking all the experimental farms into account. Selected Purple Top, 32 tons 1,272 pounds; Perfection Swede, 31 tons, 526 pounds; Bangholm Selected, 30 tons 1,606 pounds; East Lothian, 29 tons 1,847 pounds; Hartley's Bronze, 29 tons 995 pounds; Jumbo, 29 tons 382 pounds, an average of 30 tons 1,104 pounds per acre.

Q. What was the size of the plots?

A. These calculations were made from two rows in the field, each 66 feet long. We commonly sow four rows of each variety, and take the two inside in each case.

*By Mr. Featherston :*

Q. Where do you measure from?

A. We take from the centre of the row in each case, these are all sown the same width, 2½ feet apart.

*By Mr. Sproule :*

Q. Do you think the same results would be obtained in a whole field as that high average? It seems to me you never obtain the same high average as you do in these experiments.

A. Usually the plots will give a larger yield. In my evidence last year, however, I quoted a number of instances in which the field crops were larger than the plots.

*By Mr. Erb :*

Q. Perhaps the farmers do not prepare the soil as well as you do?

A. I am sure they don't.

*By Mr. Sproule :*

Q. You give results of 32 tons, that would be 1,120 bushels to the acre, which is a very heavy yield for farmers' crops. We consider about 500 to 600 bushels a pretty good yield?

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A. Yes, that is an unusually heavy yield. I am unable to give you the results from recent field crops of turnips at the central farm. At the branch farm at Nappan last year we had from 900 to 1,000 bushels per acre.

*By Mr Rogers :*

Q. Sugar beets should pay well at \$4.00 a ton at 20 tons to the acre ?

A. They would pay very well at that price.

*By the Chairman :*

Q. What size were the beets ?

A. These would be rather large for a sugar factory. We have grown them for feed.

## THE PRODUCTIVENESS OF VARIETIES.

Additional evidence has been obtained in the past year with reference to the productiveness of varieties. In 1899 we completed the five years' test of varieties of oats, wheat and barley. Forty-one varieties of oats have been under trial during the whole of that time, and the lists that we have published of the best twelve sorts in each case have been given for three years, four years and five years, and out of these forty-one varieties only fifteen have at any time found their way into the lists of the best twelve.

*By Mr. Featherstone :*

Q. There are only fifteen you recommend for growing ?

A. I said only fifteen have found their way into the lists of the best varieties, nine of the same sorts have appeared each time amongst the best twelve, and eleven of these in the best twelve for 1898 appear also in the best twelve for 1899. That is, taking the average for the five farms. The only change in the list for the past year is the replacing of the White Russian by the American Triumph. White Russian has, however, given good results—66 bushels and 2 pounds per acre as an average for five years at all the experimental farms. Banner again heads the list this year.

The average yield of the different varieties for the whole period of five years has been as follows :—

	Per Acre.	
	Bush.	Lbs.
Banner.....	75	30
American Beauty .....	74	31
Columbus.....	71	23
Golden Giant.....	71	12
Bavarian .....	71	9
Golden Beauty .....	70	2
Holstein Prolific .....	69	23
Early Golden Prolific.....	69	4
American Triumph.....	67	24
Abundance .....	67	24
White Schonen.....	67	24
Wallis.....	67	23

An average yield of 70 bushel and 13 pounds per acre for the twelve varieties for the full period of five years at all the different farms.



## RESULT OF TESTS OF VARIETIES OF SPRING WHEAT.

In spring wheat thirty-one varieties have been under trial for five years.

*By Mr. Featherstone :*

Q. Which of the oats is the best for heavy strong land ? Which is the best for standing up ?

A. I think it would be very hard to beat the Banner. That variety seems to adopt itself to many different sorts of soil.

Of the thirty-one varieties of spring wheat which were under trial for five years, sixteen only have appeared in the list of the best twelve. As in the case of oats, nine of the same varieties have appeared each time in the list among the best twelve, and those which have dropped out of the best twelve varieties this year continue to maintain their standing as very good yielding sorts, the lowest of them being less than a bushel per acre below the twelfth in the selected list. The list of the best twelve varieties of spring wheat, taking the average of the results obtained on all the experimental farms for five years, are :—

	Per Acre.	
	Bush.	Lbs.
Preston .....	32	40
Wellman's Fife.. .....	32	12
Monarch .....	32	6
Goose .....	31	14
White Fife.....	31	...
Rio Grande.....	30	53
White Connell.. . . .	30	46
Red Fife .....	30	42
Huron .....	30	31
White Russian.....	30	28
Pringle Champlain.....	30	1
Red Fern.....	29	50

The average of the whole is 31 bushels and 7 pounds to the acre. With barley the results are still more striking. Of all the varieties of two-rowed barley tested, the same six varieties which were at the head in 1897 were at the head in 1899 and five out of the same six were at the head in 1898. In the case of the six-rowed barley the same six sorts appear in the list as the best six during the whole time. The six varieties of two-rowed barley which have given the best results for the five years were as follows :—

	Per Acre.	
	Bush.	Lbs.
French Chevalier. ....	44	40
Danish " .....	42	41
Beaver .....	42	39
Canadian Thorpe .....	42	26
Sydney .....	42	16
Newton .....	41	23

Giving an average for the six of 42 bushels 39 pounds per acre.

*By Mr. Semple :*

Q. Does the Mensury not yield well ?

A. That is a six-rowed barley and these are the two-rowed. The best six varieties of six-rowed barley which have produced the largest crops for the past five years, taking the average of the results obtained at all the Experimental Farms, are :

## APPENDIX No. 1

	Per Acre.	
	Bush.	Lbs.
Mensury .....	50	15
Trooper .....	47	24
Odessa.....	47	24
Oderbruch.....	45	38
Common six-rowed.....	45	35
Royal.....	45	34

Making an average for the six varieties for five years of 47 bushels 4 pounds per acre, the Mensury leading in the yield in this list.

In peas reported on for two years, none of the same varieties appeared in the best twelve for the two years.

In the case of Indian corn, five of the same varieties are among the best six varieties for the two years.

In turnips five of the same sorts appear each year among the best six, and in mangels the same proportion is found.

In carrots the same six appear each year and exactly in the same order.

In potatoes where there are a very large number of varieties under trial and a greater tendency to vary in the field, the same tendency is manifest. Six varieties appear amongst the best twelve during the whole period. The six varieties which have appeared among the best twelve for the whole time are Late Puritan, Irish Daisy, Empire State, Clark's No. 1, American Wonder and State of Maine. Four others have appeared among the best twelve twice out of three times. These are Lee's Favourite, Carman No. 1, Seedling No. 230 and New Variety No. 1. In view of these new facts I have submitted to you and bearing in mind that in the arrangement of these plots each season, no efforts have been made to give to any variety any advantage in point of location, and since the land often varies in the same field, it seems quite remarkable, that the results covering so long a period as these tests have occupied, in different climates and in different soils, should have been so uniform in character. It is scarcely necessary to pursue this subject further. The facts given furnish the strongest proof of the inherent productiveness of varieties.

The good work we are doing in this country in the testing and introducing of productive sorts of grain, is attracting attention abroad and is bringing credit to Canada in the motherland. Prof. R. Patrick Wright, who is at the head of the West of Scotland Agricultural College at Glasgow, Scotland, wrote to me early in 1899, expressing his great interest in the work we were doing in testing varieties and asking that a selection be made from among those oats which had succeeded best here for trial in Scotland. Several varieties were sent to him and he has found, like ourselves, that the Banner stands at the head of all the varieties tried. In a letter received from him a few days ago, he says the Banner oat was tried on nine farms in different parts of Scotland against a number of other varieties, and he reports that the average yield given by the Banner oat was 4 bushels per acre more than any other sort tested. Prof. Wright, in speaking of the Banner oat, says :—

'The notable feature about the Banner, besides that it gave the highest produce on the average, was that it appeared to do well on all the kinds of soils in the experiments, and could be relied on to give a good crop on almost every farm.'

He asked for a further supply of seed, in order to enable him to continue these tests in Scotland, which he intends to undertake on a larger scale, and 12 bushels of Banner oats were lately sent to him for this purpose with 8 bushels of Golden Giant, a variety which has also given good satisfaction.

## CHANGE OF SEED GRAIN.

Another point which I wish to bring before you is with regard to some experience had during the past year, which seems to bear evidence to the benefit arising from change of seed. Last year a fresh supply was imported of three varieties of

oats which had been grown at all the experimental farms for the past five years, to see what effect, if any, would be produced by a change of seed. The varieties were Improved Ligowo, California Prolific Black and Prolific Black Tartarian: The first two were imported five years ago from the same parties in France that we got the seeds from this year. The Tartarian was imported from England a year or so earlier. But these three varieties were all imported from France in this instance. They were sown on all the Experimental Farms at the same time, side by side with seed that had been home grown for five years. The Improved Ligowo, from home grown seed, gave an average of 67 bushels 9 pounds to the acre, while the imported seed gave 72 bushels 16 pounds, a difference in favour of the imported seed of 5 bushels 7 pounds per acre.

*By Mr. Rogers :*

Q. Do you find that the black oat deteriorates quicker than the white oat?

A. I scarcely like to offer an opinion upon so complicated a question, and one so difficult to gain reliable information on.

*By Mr. Featherston :*

Q. You got a better return from the imported seed in this instance than from the home-grown seed?

A. Yes.

Q. Did you give it the same test?

A. Yes, and the home-grown seed was obtained from oats grown here from seed imported from the same source five years ago.

*By Mr. Rogers :*

Q. Do the black oats retain their colour?

A. The California prolific black retains its colour better than the black Tartarian. The imported black Tartarian gave 80 bushels to the acre, while the home-grown seed gave an average of 74 bushels 15 pounds per acre, a difference of five bushels 19 pounds per acre in favor of the imported seed. California prolific black gave 70 bushels 6 pounds per acre, while the imported seed gave 79 bushels 32 pounds, a gain of 9 bushels, 26 pounds per acre, the average gain of these three varieties from the imported seed was 6 bushels 29 pounds per acre.

*By Mr. Featherston :*

Q. It would be better then to import your seed every year?

A. I do not know that you would get the same every year. But these results seem to show that after growing the same variety for a number of years, some advantage is likely to arise from a change of seed.



COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
THURSDAY, March 22, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 11 o'clock a.m., Mr. McMillan, Chairman, presiding.

Dr. W. SAUNDERS, Director, Dominion Experimental Farms, was present at the request of the Committee and made the following statement:—

PLANT FOOD TAKEN FROM THE SOIL BY DIFFERENT CROPS.

MR. CHAIRMAN AND GENTLEMEN,—Before presenting the subject I proposed to take up to-day, I wish to take the opportunity of replying to a question asked yesterday and upon which I promised to bring information this morning, as to the relative quantities of fertilizing materials which are taken from the soil by different crops. A wheat crop of 24 bushels of grain per acre with 2,200 lbs. of straw takes from the soil 40·53 lbs. of nitrogen, 17·64 lbs. of phosphoric acid, and 19·11 lbs. of potash.

Barley, with a crop of 35 bushels of grain and 2,000 lbs. of straw, takes 45·48 lbs. of nitrogen, 17·14 lbs. of phosphoric acid, and 28·25 lbs. of potash, as against 19·11 lbs. taken by wheat, showing that barley has a more exhaustive effect upon the soil in potash but takes up about the same as wheat with regard to nitrogen and phosphoric acid.

Oats, with a crop of 50 bushels of grain and 2,200 lbs. of straw, takes from the soil 46·3 lbs. of nitrogen, 15·22 lbs. of phosphoric acid, a little less than the barley or wheat, and 32·88 of potash, a little more than that taken from the soil by the barley and considerably more than that taken up by wheat.

Indian corn when cut for ensilage at 15 tons per acre will take from the soil 87 lbs. of nitrogen as against 40·53, 45·48 and 46·03 for wheat, barley and oats; the Indian corn crop also takes up 44·40 lbs. of phosphoric acid and 98·10 lbs. of potash. That is 98·10 for corn against 19·11 by the wheat crop, 28·25 by the barley and 32·88 by the oat crop.

I think similar information was also asked with regard to turnips,—taking a crop of 15 tons of roots only, and leaving the tops on the ground to be ploughed under, this takes from the soil 49·50 lbs. of nitrogen, 27·90 lbs. of phosphoric acid, and 82·25 lbs. of potash. Mangels take practically about the same of nitrogen and phosphoric acid and a larger proportion of potash. The quantities are nitrogen 45·45 lbs., phosphoric acid 27·60 lbs., and potash 114·90 lbs. taken from the soil where 15 tons of mangels are produced per acre.

In the case of carrots with a similar crop of 15 tons per acre of roots only, 35·25 lbs. of nitrogen, 33·30 lbs. of phosphoric acid and 97·95 lbs. of potash.

Sugar beets are especially exhaustive of potash and take up 135·90 lbs. per acre where 15 tons of roots are grown, which is a larger proportion of potash than is required by any other crop I have named.

*By Mr. Wilson:*

Q. That is a different statement to what a gentleman made here the other day?

A. Yes, it is, but the analyses which have been made show that 15 tons of these roots grown on an acre take from the land 71·85 lbs. of nitrogen, 28·80 lbs. of phosphoric acid, and 135·90 lbs. of potash.

Potatoes take much smaller proportions of these elements from the soil. A crop of 200 bushels per acre of tubers takes 25·20 lbs. of nitrogen, 8·40 lbs. of phos-

phoric acid and 34.80 lbs. of potash. With regard to the proportion of potash, however, the results of different analyses have varied. The figures I have given you are the average results of a number of analyses which have been compiled in a hand book published by the United States department of agriculture several years ago, but some European authorities claim that the proportion of potash is larger, and in one case it is given as high as 52 lbs. in place of 34. The difference in the soil where the potatoes are grown might make some difference in this respect, especially if the land is well supplied with this form of plant food.

*By Mr. McGregor :*

Q. How can you account that in common land I have seen 20 and 22 crops of corn running year after year and yet all were good crops. According to your estimate it would not be possible for the land to do this ?

A. Much would depend on the original store of potash in the soil, which varies from five, seven or eight thousand pounds per acre, and the taking of say 100 lbs. per annum would require a long time to exhaust the store, especially if the land received a good dressing of barn-yard manure every four or five years, which would put back into the soil a large quantity of this element.

*By Mr. Hurley :*

Q. Was the corn on which this calculation is made grown broadcast or in hills ?

A. I have taken in this estimate the production of ensilage corn 15 tons per acre cut at the glazing stage. This would be sown in rows or hills it does not matter which, corn sown broadcast produces such watery feed that it is of comparatively little value.

Q. Sowing corn broadcast is very hard on the land. You could hardly get the second crop without manuring it, whereas if you sow it in drills and hills you can get a good crop every year.

A. That is probably on account of the cultivation and stirring of the soil which allows the sun and air to act on the crop to its advantage.

#### RESULTS FROM THE CROSS-FERTILIZING OF APPLES.

Another subject which I desire to bring before you is the results we have had this year from experiments begun five years ago in the crossing of apples, with the object of producing varieties hardy enough to stand the climate in Manitoba and the North-west Territories. The basis of this work rests on the extreme hardiness of a species of Siberian crab, a native of northern Russia, the seed of which was obtained from the Royal Botanic gardens at St. Petersburg the first year the experimental farms were started. The trees grown from this seed have proven entirely hardy at Brandon and Indian Head, where they have borne fruit quite freely. I have an example here of this hardy crab known as the Berried Crab *Pyrus baccata*. This fruit was crossed with several varieties of hardy apples including the Tetofsky, one of the hardy Russian varieties, and the Wealthy, both of which kinds are grown in nearly all the northern parts of Ontario and Quebec. Some interesting results have been obtained among these crosses, five of which have proven worthy of being named, and will be propagated for more extensive trial. Thinking these fruits would interest you, I have brought samples with me preserved in antiseptic fluids.

*An Hon. Member :*

Q. It is quite interesting.

A. Three of these are crosses between the Russian *Pyrus baccata* and the Tetofsky, and two of them between that and the Wealthy. I have a photograph here also which shows these fruits of the exact natural size, from which you will be able to judge of the advance which has been made in this instance by cross fertilizing.

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By Mr. Douglas:

Q. Have any of these been grown in Manitoba?

A. There are some of them growing there at the Brandon Experimental Farm, but they are not old enough to fruit yet.

The fact of the introduction of foreign blood into this wild species of *Pyrus* may make it a little less hardy than the original, but the fact that we have already tested, at Brandon and Indian Head, some of these varieties for one or two winters, points to the probability of their proving quite hardy.

## CROSS-BRED FRUITS—VARIETIES AND CHARACTERISTICS.

The work of cross-fertilization has been going on for five or six years, and there are now altogether nearly five hundred of these cross-bred fruits, each one a distinct variety. Last year 36 of these fruited, and out of these 36 five have shown points of special promise, and these will be propagated and tested in the northern parts of Algoma, in Ontario, throughout Manitoba and in different parts of the North-west Territories to the Rocky Mountains. These trees for trial will be placed in the hands of individuals who take a great interest in this subject, and we shall thus very soon find out how far they will be adapted to all the different climatic conditions which obtain in the districts referred to.

I will now call your attention to special characteristics of these several new varieties.

The variety Charles is a cross of the Tetofsky on the *Pyrus baccata* or Siberian crab. The tree is a very vigorous and upright grower, with large leathery leaves of considerable substance, and it branches quite close to the ground. The blossoms are deep pink in bud, a pinkish white when open, large, with wide petals. The fruit sets well on the tree, and when ripe the size was  $1\frac{9}{16}$  inches broad and  $1\frac{1}{16}$  inches deep. It is very distinctly ribbed, and the colour is a uniform yellow, very attractive, flesh yellow, solid, crisp, juicy, very mildly acid and very slightly astringent, flavour pleasant, skin rather thin, bakes well, makes very good apple sauce, and when compared with the Transcendent crab the size was practically the same, the acidity and astringency a little less. Stem long, calyx persistent.

The Novelty is a cross of the Wealthy on *Pyrus baccata*. The tree is fairly upright and a vigorous grower with good foliage. On this tree there were only a few bunches of bloom. These, however, set well. The fruit was ripe September 19; size one and a half inches across and one and a quarter inches deep, smooth, colour deep red, flesh a pale yellowish pink, firm, crisp and juicy, sub-acid and of fair quality. Stem long, calyx usually persistent, bakes well, quality very fair. This is the largest and best of the Wealthy crosses that have yet fruited.

The next one is the Aurora, a cross of the Tetofsky on the Siberian crab (*Pyrus baccata*). The tree is a vigorous grower upright in habit, leaves large, thick and leathery. It blossoms freely and the fruit sets well, ripe September 11; size  $1\frac{7}{16}$  inches across,  $1\frac{3}{16}$  inches deep, colour bright red, almost all over, very pretty, flesh crisp, juicy, acid and of fair flavour, astringency very slight. When baked the fruit is acid but of good flavour. Stem long, calyx persistent.

The Progress is a cross of Wealthy on the *Pyrus baccata*. The tree is a vigorous grower and fairly upright in habit. It blossomed freely, and the fruit set well. The fruit was ripe September 14; size  $1\frac{5}{16}$  inches across  $1\frac{3}{16}$  deep. Colour deep red with some yellow and with a dark red cheek. Flesh very firm, crisp, sub-acid, juicy, astringency scarcely perceptible, of fair flavour. Stem long, calyx persistent.

Prairie Gem is a cross of Tetofsky on *Pyrus baccata*. This tree is a moderately vigorous grower and rather spreading in habit. It blossomed freely and was heavily laden with fruit from top to bottom. The fruit was ripe August 30. Size 1 inch across and 1 inch deep, colour brilliant yellow and crimson, flesh crisp, juicy, acid, flavour good, almost free from astringency excellent for jelly, deficient in size but promising for its earliness, its good quality and profuse bearing habit.



*By Mr. Wilson :*

Q. Have you the apples here that you crossed with ?

A. I did not bring them with me. They were the Wealthy and the Tetofsky. These varieties are so well known that I did not think it necessary to bring them.

Q. It would have been nice to have had them together to compare and see the improvement ?

A. It would, I fear, however, that the only preserved specimens we had, have gone forward with the collection sent to Paris.

*By Mr. Rogers :*

Q. The Tetofsky I think is not an annual bearer, it bears only every two years ?

A. On the Experimental Farm here it bears almost every year. It depends largely on the amount of the crop. It is a very heavy bearer at times, and if it bears heavily one year the crop is generally light the year following. All these varieties of cross-bred apples to which I have referred are remarkable for the persistent manner in which the fruit is attached to the tree. The stems are so firmly fastened that they require a considerable effort to detach them. The trees are all very strongly built with the branches bound to the trees with bands of woody fibre which are difficult to break. These peculiarities will be very advantageous where strong winds prevail. Root grafts were made of some of these varieties two years ago on account of their promising growth before we knew what the fruit would be like, and some of these, notably the Charles, which is perhaps the best of them all, wintered last year at Brandon and came through very well. A further supply was sent again last spring, also in advance of fruiting, both to Brandon and Indian Head, and now these varieties which have fruited will be sent for test in larger numbers. There is every reason from their parentage to expect that they will prove hardy, and there is no doubt if they do they will be highly appreciated. It is not anticipated that these new fruits will be much esteemed where larger apples can be grown, but if such fruits as these can be grown without special care or protection by farmers generally throughout the colder sections of our country, they will prove a great boon to the settlers in these districts and furnish a wholesome and healthful addition to the food of the people.

As the five varieties named have all been selected from the first 36 crosses which have fruited, it is probable that many other equal or possibly superior sorts to these here described may be found as the other cross-bred specimens come into fruit. Among those which are yet to fruit are crosses which have been made with a number of our best and hardiest sorts of apples.

The results I am now reporting are but the first steps in a series of experiments that are full of interest and promise to be of great importance and value to large areas in the Dominion. As the more promising of the cross-bred sorts bear fruit, seeds from the largest and finest specimens are being sown, from which we may expect many interesting sorts ; and now that the continuity of nature has been broken by the work of cross fertilization, it is proposed to carry on the work of selection with seedlings of those crosses from which increase in size and improvement in the quality of the fruits will in all probability be gained, and within a few years we shall no doubt have a considerable number of useful sorts of apples, ripening at different periods, which will endure the climates of all the settled regions of the North-west country. Similar improvements were made by our forefathers with the original wild crabs, which were the only apples in early times, and there is no reason to doubt but that, by raising a large number of seedlings from the best examples of fruit, while some will sport back to the original, others will probably give us fruits of superior character.

*By Mr. Dugas :*

Q. Is this (referring to the photograph shown the committee) a different kind of apple or the same ?

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A. The small apple in the centre is the seedling we started from the wild *Pyrus baccata*, and by the crossings referred to the fruits have been brought up to the size shown. They are useful fruits, valuable for jelly, and the large ones make good apple sauce and bake well.

By Mr. Wilson :

Q. This small one is very like the Hawthorn ?

A. Yes, that is the original wild form of *Pyrus baccata*.

By Mr. Hurley :

Q. Was the Wealthy apple you crossed with the common variety ?

A. Yes sir, it was the ordinary Wealthy.

By Mr. Wilson :

Q. What is the numbering on this photograph for ?

A. The varieties are numbered on the plate merely for convenience for reference.

Q. Number "1" is not then the best there ?

A. No. The numbering was not made from the standpoint of quality.

#### TREE PLANTING ON THE NORTH-WEST PLAINS.

Much interest has of late been manifested in this country in the subject of forestry. This is a most important matter and one deserving the attention of every statesman. The necessity of husbanding our timber resources, protecting them against fire, and preserving a fair proportion of forest and wood land throughout the Dominion is of the utmost consequence to the welfare of the people. One important division of this subject relates to tree planting, and the need of trees for shelter and protection is strongly felt in the North-west country, particularly in the treeless districts. Persistent work has been carried on in this connection by the experimental farms ever since their organization, and one of the experimental farms, that at Indian Head, was purposely located on a bare prairie section of land, where at that time there was scarcely a tree or shrub anywhere within sight, so that a practical test might be made as to what could be done in successful tree planting there. Before giving you the particular results had on this prairie farm, let me present to you some details of the work done at the central farm in Ottawa to gain information in reference to tree growth. At the Central Experimental Farm, in 1888, tree growing experiments were begun and a block of land 165 feet wide, extending all across the west end of the farm was set aside for that purpose. A narrower strip 65 feet wide has been similarly planted along the northern boundary of the farm. This planting was continued year by year and completed in 1894. It was not found practicable to complete this planting in one or two years. About 3,000 trees were planted in 1888, 7,700 in 1889, and continued after that from year to year and completed in 1894. There are now growing in these forest plantations about 21,000 trees, including all the more important timber trees which are hardy in this climate. The objects in view in planting these forest belts at Ottawa were : first, to test by actual experiment the relative growth in circumference and height of a number of different sorts of trees when planted at different distances apart. The distances chosen for this trial were 5 feet by 5, 5 feet by 10, and 10 feet by 10.

Q. Were these trees planted in this way to stay ?

A. They were planted in permanent plantations for experimental purposes. The distance of 5 feet by 5 apart is commonly recommended in most of the north-western States as the distance at which blocks of forest trees should be planted. Some were planted 10 feet by 10 and others 5 feet by 10, and thus we have had the opportunity of testing how the trees succeed under these different conditions. The

second object in view was to gain information as to the relative growth of trees when planted all of one variety in a block, as compared with mixed clumps, and the third object was to gain information as to whether crops located near these tree belts would be favourably influenced by the shelter they afford.

Q. Will you come to the results of that ?

A. Yes, I can give you the result of the growth.

Q. No, the effect of shelter on the crops ?

A. We have not noticed effects in this respect in Ottawa, but I can give you instances of benefits resulting from shelter on the branch farm in the North-west.

Q. Could you give us that in your statement now ?

A. I shall with pleasure. Two or three years ago we sowed Banner oats at Indian Head on land in two different locations. In one case there was a shelter belt of trees 100 feet wide which at that time had reached a height of 20 feet ; these were within a short distance of the oats. Another plot of the same variety was sown on the same day at a considerable distance from this belt. The plot that was sown distant from the belt was exposed to strong winds, which interfered much with successful growth, and the result was that the yield was 56 bushels from the exposed plot, as compared with 102 bushels from the plot which had the advantage of the shelter.

Q. Were the conditions in every other respect the same ?

A. The soil was of the same character and quality, and but for the fact that on the exposed plot some of the soil was blown from the roots, the conditions otherwise were apparently the same.

*By the Chairman :*

Q. Was the belt to the west ?

A. Yes, the belt was to the west. We have also had striking examples of the beneficial effects of tree shelter on that farm on root crops. In the North-west most of the crops depend largely on the proportion of moisture in the ground. The belts of trees collect banks of snow which extend quite a distance. The snow lies there until spring and when melting produces conditions of moisture much more favourable for the early starting of the seeds than where there are no shelter belts, and hence we have had instances where the crops of roots were much larger where sheltered by tree belts than they were on the more exposed parts of the farm.

The pleasing effects on the landscape produced by artistic grouping of the trees have not been overlooked ; at the same time the main purpose has been to gain such practical information relating to the growth of the more important timber trees in this climate as would serve as a guide in future timber growing.

*By the Chairman :*

Q. You would not approve of planting belts of trees on the south or east side of the fields ?

A. No ; in this country they seem to be more useful on the west or north side.

*By Mr. Wilson :*

Q. It is not that they would do damage if they were on those sides, but that they are more beneficial, is it not ?

A. Yes. The prevailing winds come from the north and west, and by breaking the force of these winds the crops are sometimes benefitted. The limbs of trees are marvellously built so as to offer obstacles to the continued course of the currents of air, and are very effective in breaking the force of such currents.

Q. All I want to know is whether you think it would be better without belts on the south and east than it would be if you had them ?

A. I don't think there would be any likelihood of injury from a belt on the south side, and it would certainly help your neighbour on the other side.



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Q. There is nothing like being neighbourly, you know?

A. It would no doubt please your neighbour.

Q. Would a belt on the south be likely to benefit the crop?

Q. I think the benefit to the crop would come chiefly from trees on the northern and westerly sides.

The CHAIRMAN.—My experience is that with a belt along the south side of the field you do not get the same crop for a distance from the belt as you do on the other parts of the field, while if you have it on the north side you will get a better crop.

A. In bringing this subject before the committee at this time, my object is to show what the experimental farms have been doing along this line of special work, and that by persistent effort, in distributing young trees and tree seed, we have done much to stimulate tree growing on the North-west plains.

*By Mr. Calvert :*

Q. How many years is it before you get the benefit of the trees?

A. I have specimens of the trunks of young trees here from Indian Head which will illustrate that. This is a specimen of the Russian poplar, nine years from propagation by cutting, that probably is the most rapid growing tree we have tested.

*By Mr. Wilson :*

Q. How large was this cutting when planted?

A. It was a small branch or twig probably about as thick as a lead pencil. Another, a specimen of the Dakota cotton wood, has been produced from a cutting in eight years.

Q. What do you mean by a cutting?

A. A cutting is an ordinary twig or branch, eight to ten inches long, which is buried in the soil up to the terminal bud. This sends out roots very soon, especially if the ground is moist, and the young tree makes rapid growth.

Q. Do you mean to say that it has produced this size from a cutting in nine years?

A. Yes, sir. That is a very rapid growing tree. These samples are from trees cut a foot from the surface, so as to have them uniform in diameter.

Another sample I have here is one of the Manitoba maple nine years from the sowing of the seed. The height of this tree will probably have been about twelve to fourteen feet.

Q. Will this be a fair average or is it one of the best specimens?

A. That is one of the best specimens. I cannot say how far it would be an average, but I think that the character of the growth would be very even except where the trees were crowded. When cut from a plantation which has been set out five feet apart, some will be found much larger than others, chiefly owing to less crowding and greater advantages in the way of light and air.

Q. Do these spring up from the roots like poplar?

A. No, they do not sucker. This specimen is interesting because we knew its age from the seed, and it is to the growing of trees from seed that we expect the best and most useful results.

*By Mr. Calvert :*

Q. How many years growth from seed are these trees?

A. Nine years. In order to show you that all varieties of trees do not grow as rapidly as this one, I show you an American elm, eight years from transplanting as a seedling a year old. This tree is a very slow grown. I also have here a specimen of the green ash, a native of the country, this is also of slow growth, but is very tough and hard when grown. This shows the growth in eight years from the sowing of the seed.

*By Mr. Wilson :*

Q. From that out would it grow much more rapidly?

A. I think that very likely it would.

Q. At the recent meeting of the Forestry Association it was said that trees grew faster at one period than at another?

A. That is no doubt correct, that at certain ages trees make more wood than they do earlier or later. The growth of trees is much like animals in that respect, there is a period of robust and vigorous youth and you finally get to the period of old age when—

Q. That is the time you grow the other way?

A. Yes, the growth is very slow.

*By Mr. Calvert :*

Q. According to that we would have no difficulty in keeping our forests up?

A. If properly cared for they would no doubt produce a large annual growth.

#### DISTRIBUTION OF FOREST TREES FROM THE CENTRAL FARM.

In 1888, 2,800 young forest trees of 28 different sorts were sent from the central farm to the branch farm at Nappan, Nova Scotia, where we have been doing some tree testing in order to gain experience in that climate. We also sent 20,000 the same year to the farm at Indian Head. In 1889 additional supplies of trees and shrubs were sent to Nappan; 12,000, comprising 118 varieties, were forwarded to Brandon, 15,000 to Indian Head and 7,000 to Agassiz. The latter consignment consisted chiefly of young trees of the most valuable hardwoods of the east. Experimental gardens in which forest trees were to be tested were laid out that year by the Canadian Pacific Railway at 25 different points along the main line between Moosejaw and Calgary. To each of these stations a bundle of well rooted young forest trees was sent from the central farm, each containing 175 trees of 37 different species.

During that season also 700 one-pound packages of seed of the Manitoba maple were sent to the settlers in different parts of the North-west Territory and Manitoba. Each of these packages containing seeds capable of growing from 500 to 700 trees.

*By Mr. Wilson :*

Q. Did you get any returns of the results.

A. Yes, many returns were made.

In 1890, 21,700 trees and shrubs were sent to the experimental farm at Brandon, 15,000 to Indian Head, and 8,000 to Agassiz. To farmers, chiefly those residing in the North-west, there were sent that season 131,600 young forest trees and shrubs in 1,316 packages of 100 each with instructions for their planting and care; 563 lbs. of tree seeds were also distributed. About 3,500 trees in packages of 150 each were also sent that season to the chief stations of the mounted police and to the Indian agencies in different parts of the North-west country.

In 1891 smaller supplies were sent to Nappan, Brandon and Indian Head, chiefly of sorts not hitherto tested and an additional quantity of 7,284 to Agassiz, B.C. 200,000 young forest trees were sent by mail to farmers in Manitoba and the North-west Territories in 200 packages, each containing 100 trees. During 1890 the trees in the North-west country bore an abundant crop of seeds and with the aid of Indians and half-breeds nearly 3 tons of tree seeds were collected in different parts of the North-west country from native trees growing in the coulées and in the ravines, as we have found that seeds grown in the country produce trees which succeed best there. The next season 4,053 one-pound packages of tree seeds chiefly box elder and green ash were sent out to as many different farmers in Manitoba and the Territories. In 1892 and each succeeding year many additional varieties of trees were

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sent for test to the Brandon and Indian Head farms and also to the other branch farms in order to prove those which are most hardy and useful in the different climates of the Dominion. A large number were also sent out that year to farmers in the North-west, not only from the central farm, but also from the Manitoba farm. Since 1894 this tree distribution has been carried on almost entirely by the branch farms at Brandon and Indian Head, settlers in Manitoba sending for such things to Brandon, while those in the North-west Territories have been supplied from Indian Head.

*By Mr. Rogers:*

Q. Is that maple considered a success up there?

A. Yes, I think it is the most successful tree we have grown there.

*By Mr. Erb:*

Q. Is this propagated from the seed only?

A. It does not sucker, and we have never tried to grow it from cuttings. It is so easily raised from seed that we have raised large quantities of seedlings and send them out when they are one year old. In the west we must I think depend on the distribution of tree seeds for the extension of this good work. That course has given us thus far the best results.

Q. Is this tree liable to send out shoots from the base of the trunk like our soft maple?

A. Yes, it has much the same habit, but with a little trimming this can be overcome when the tree continues to grow with a nice clean trunk, that is after six or eight years' growth.

Q. Is it not one of the peculiarities of this tree that its trunk grows crooked?

A. Yes, the trunk does very often grow more or less crooked.

Q. I have seen them in nurseries in our part of the country and there was hardly one with a straight stem.

A. With a little care in trimming when young most of them can be grown fairly straight. There are avenues of these trees growing on the Experimental Farm at Brandon which are as straight a lot of trees as you want to see, but it has the tendency to grow crooked and sometimes in individual specimens it is difficult to control. It is better when planting an avenue or grove to reject those that are crooked and select the best. The Norway maple has the same habit, and this is regarded as a valuable tree in Europe and in Ontario and the East. The tree planting and distribution at Ottawa during the past 12 years has aggregated as follows:—

At the Central Experimental Farm there has been planted including forest belts, avenues, ornamental planting, hedges and arboretum, over 40,000 trees. The distribution to the branch farms has been as follows: To Nappan about 4,000, Brandon 65,000, Indian Head 70,000 and Agassiz 35,000.

The distribution from Ottawa throughout the Dominion, which has been chiefly to settlers on the North-west plains, has amounted in all to about 560,000 young forest trees, sent out in bundles of 100 each, and about 9,000 lbs. ( $4\frac{1}{2}$  tons) of tree seeds.

At Nappan, Nova Scotia, from the forest trees and shrubs sent there much useful information has been gathered in reference to the hardiness and suitability of the different species to that climate. Small permanent plantations have been made and a limited number of trees distributed among the farmers of the maritime provinces for trial.

#### TREE GROWING IN MANITOBA.

At Brandon, Manitoba, a large proportion of the 65,000 trees and shrubs sent from the central farm have been for trial planting on that farm. While many of the varieties have proved too tender for that climate and a large number of trees have died, a very large number have been successfully grown. Many thousand



young trees have also been raised from seed on this farm and set out in the plantations. The number of trees and shrubs now growing at Brandon, in wind-breaks, avenues, hedges and the arboretum, is from 70,000 to 80,000. The work done on this branch farm has greatly stimulated tree growing in Manitoba, and the public have availed themselves freely of the information and practical object lessons given there.

From this farm there has been distributed among the farmers of Manitoba, of young tree cuttings and tree seeds in all up to the present time, about 600,000 and about 1,800 lbs. of tree seeds.

#### TREE GROWING IN THE NORTH-WEST TERRITORIES.

At Indian Head, North-west Territories, the branch farm has also done much to promote tree growing on the plains. To such trees sent there from the central farm as have proven hardy, there has been added a large number of native trees raised from seed collected in the Territories, and the total number now growing on that farm is about 125,000.

There has also been sent out from Indian Head to farmers in the Territories, in packages of 100 each, about 220,000 young forest trees and cuttings, and about 4,000 lbs. (two tons) of tree seeds.

#### TREE GROWING IN BRITISH COLUMBIA.

At Agassiz, British Columbia, the greater part of the 35,000 young trees received, about two-thirds of which have been of hard woods from the East, have been used for planting on the farm, mostly on the sides of the mountains, with the object of finding out whether these trees, so valuable for their timber, can be successfully grown in that climate. A limited distribution has also been made to parties specially interested in tree growing in British Columbia.

The figures I have given you show that during the comparatively brief period of 12 years since the experimental farms were founded, the trees planted on the five experimental farms number in all about 245,000, and during the same time there has been sent out to individual lovers of trees, in lots of 100 each, more than one and a quarter millions of young forest trees and cuttings, and about 15,000 lbs. ( $7\frac{1}{2}$  tons) of tree seeds, every pound of which, with ordinary care, will produce from 700 to 800 young trees.

*By Mr. Wilson :*

Q. Was any charge made for these ?

A. No, they are all sent free.

*By Mr. Calvert :*

Q. Where do you get these trees ?

A. We have grown them at the experimental farms at Brandon and Indian Head, chiefly from seeds of the Manitoba maple and ash collected in the North-west. Besides these the seeds of many shrubs have been distributed. The Caragana is one of these, a tall growing shrub valuable for hedges or for growing singly on the lawn. Some other useful sorts have also been distributed.

*By Mr. Semple :*

Q. Have you experimented with fir trees in the West ?

A. Yes, we imported in 1888 from one of the Russian government forests, North of Riga, seeds of the hardiest form of useful pine we could get, a variety of the Scotch pine, and raised about 50,000 or more of young seedlings and distributed them. We have a few of them growing on the branch farms quite successfully now, but they

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have not been a success generally. It seems to be a very difficult matter to grow any other evergreen than the white spruce in the North-west. That is native in some parts of the country and can be transplanted without much difficulty. We have not found any of the European evergreens entirely hardy there in the open, but, when shelter is provided by the growth of native trees, the Scotch pine and Norway spruce will sometimes succeed. The Manitoba maple or box-elder is now very generally distributed. There is scarcely a farmer in the West who has not his little plot of trees, some five or six years old, some younger. These plantations furnish more or less shelter for the buildings and stock and for the growing of garden vegetables, small fruits and flowers, and at the same time make the dwellings of the settlers more attractive and homelike. Since experience has shown that the box-elder, the tree most used in this distribution, grows rapidly and begins to produce seed when about six or seven years old, a very large number of the seeds distributed during the earlier years must have reached seed bearing age and the quantity of seed convenient and available will now be greatly increased from year to year, and thus an immense impetus given to tree growing on the western plains. On the experimental farms at Brandon and Indian Head large supplies of seed are now ripened every year, sufficient to provide for an extensive distribution every season.

Tree planting is a very important question for the North-west country, and I believe that every effort should be made to assist settlers in their efforts to provide shelter for their homes and to make them more attractive.

*By Mr. Wilson :*

Q. You have done well to bring up this important matter. I am sorry none of the representatives from the North-west are present.

## COST PER ACRE OF GROWING FOREST TREES.

*By Mr. Erb :*

Q. Before leaving the tree question, have you any figures to show the cost per acre up to the present of the tree planting on any of the farms ?

A. We have kept an account of the cost of planting per acre and of cultivating until the trees were large enough to shade the ground so as to prevent weeds from growing, and hence need no further care at the branch farm at Brandon, Man., where it has cost \$16.25, also at Indian Head, N.W.T., where it has cost from \$12 to \$18 per acre, varying with the kind of trees used and the distance at which they were planted.

*By Mr. Wilson :*

Q. Do you bestow any labour on the trees after planting them ?

A. We use a horse cultivator between the rows—that is generally done twice each season—and have also to do a little hoeing. As a rule, by the time the trees are four or five years planted they shade the ground so completely as to require no further care.

## METHODS OF PLANTING.

*By Mr. Calvert :*

Q. Did I understand that you planted the trees five feet apart ?

A. Yes, usually five feet apart each way.

Q. How many rows do you usually put in your shelter belts ?

A. At Indian Head it is 20 rows, that is 100 feet in width ; this runs all along the north and west borders. On the east we have a hedge where the trees are growing close together. This has been produced by sowing a single row of tree seed and the seedlings are allowed to grow thickly. In this way a hedge is soon formed

without much labour. On the south boundary there is an avenue planted of trees 20 feet apart.

Q. Do you think that necessary for every farm, a belt 100 feet wide ?

A. Not necessarily so. In the North-west, however, where the winds are very strong, it requires a wide belt to break their force. Possibly a narrow belt might serve the purpose.

Q. You have not planted them any less ?

A. We have on the central farm here, where the belts are 65 feet in width on the north boundary and 165 feet in width on the west boundary. At Brandon and Indian Head we have used thick hedges as wind-breaks, made by planting two and three rows of trees three feet apart, the trees being put about two feet apart in the rows, and these have soon formed excellent shelter.

*By Mr. Erb :*

Q. On the central farm what variety of maple do you find most suitable ?

A. The sugar maple is perhaps the best, but the white or silver grows the most rapidly. The silver maple is a soft maple, a native of Ontario, and is found as far west as Minnesota. The leaves are silvery underneath.

Q. Does it ripen its seed here ?

A. Yes, and also when grown further north. The furthest point north that I know of where these trees are growing is near the old station at Portage la Prairie, Manitoba. These are 8 or 10 trees in a group there old enough now to bear seed, and I have made arrangements when they bear seed to have it collected. If we can get seed from so far north they will probably produce seedlings hardy enough to stand the climate in most parts of Manitoba. There are several of these trees growing at Winnipeg also.

*By Mr. Wilson :*

Q. Don't you find the ordinary soft maple about as good as any in this section ?

A. Yes, but it does not do as uniformly well as the sugar maple.

Q. It grows more rapidly ?

A. It does grow more rapidly at first but after a time the sugar maple will usually overtake it and eventually make a larger and better tree in this climate. You will see along the streets in Ottawa that the sugar maple is healthier than the red maple.

Q. And it is a finer looking tree, too ?

A. Yes, I think it is.

*By Mr. Rogers :*

Q. To what height does the box-elder grow in Manitoba ?

A. There are old trees growing along the river valleys and elsewhere that will sometimes measure two feet or more in diameter. The largest planted tree I know of is one at Silver Heights, a farm owned by Lord Strathcona. There are Manitoba maples growing there that will measure about 18 inches through, and range from about 30 to 35 feet high.

#### DISTRIBUTION OF SAMPLES OF SEED GRAIN.

The usual annual distribution of trial samples of cereals and potatoes is now in progress. The interest in this work is unabated and although the samples are now sent only on individual application the demand is as brisk as ever. This is indicated by the correspondence we receive. During the month of February the number of letters received by the Director was 13,054 and in March up to and including yesterday, the 21st, there were received 14,746 letters, making a total of 27,800 letters in 49 days, being an average of 662 per day for the whole period.



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*By Mr. Wilson :*

Q. How many secretaries have you to answer them ?

A. We have no increase in the staff for this purpose, we have two looking after the French letters, and two working at the English letters. We try to send, as far as possible, to each individual some sort of answer. A large proportion of the letters I referred to are answered by promptly sending the samples requested. These have been going out for some time at the rate of 400 to 450 per day. If samples cannot be mailed promptly, we send as far as practicable an acknowledgment. There are always, however, baskets full of letters which require special answers sufficient to keep the officers all busy.

*By Mr. Calvert :*

Q. Where do they come from ? largely the West ?

A. From all over the Dominion.

*By Mr. Wilson :*

Q. You occasionally get postcards that seem to be similar in dictation ?

A. We do get some.

Q. I have heard of members getting them ready and sending them out for people to put their names to.

A. They come in sometimes very similar in composition ; occasionally ingenious devices are resorted to for correspondents to assure larger quantities for individual use than our regulations allow. For instance, we will sometimes get ten or twelve letters all in the same handwriting asking for samples for James and Tom and Mary and Mrs. and Mr. so and so, and half a dozen other names of children, all asking for some particular variety of grain evidently for the purpose of getting a large quantity for one farmer. All such are referred to me and I endeavour to deal as justly as I can in such cases. The number of the three-pound samples which have been sent out by mail this season up to the present time is 10,730. These have been sent to the different provinces as follows : Ontario, 2,778, Quebec, 2,714, Nova Scotia, 1,402, New Brunswick, 1,292, Prince-Edward Island, 454, Manitoba, 1,318, North-west Territories, 648, and British Columbia, 124. I suppose we must have from 15,000 to 20,000 applications still on hand to fill before the season is over.

A new feature was introduced in connection with the distribution of seed grain last year, that was the sending to a few of the best farmers in every constituency in the Dominion a larger sample, sufficient to sow one-tenth of an acre, and this has worked very well. A great deal of interest has been taken in it.

*By Mr. Wilson :*

Q. How did you find out the farmers to send to ?

A. The plan adopted was this, we took the returns which had been made on the 3 pound samples by farmers the previous year, went over some seven or eight thousand of them, and selected from these a limited number in each constituency of what we believed to be the best farmers, taking those which by their reports showed most interest in this work.

Q. The reason I asked was that I have not heard anything from my constituency of anything of that kind.

A. I have the names in the book which I have with me, and can give those in any constituency if desired.

Q. That is all right, never mind now.

A. A similar distribution has been authorized by the minister this year and is now in progress. Up to this time 1,351 of these special samples have been sent to applicants. The plan adopted this year is to send again to those who made prompt reports of the test of the variety, if they so desire, allowing them to select the sort they prefer to test, and adding to the list from time to time the names of any good

farmers suggested, provided we do not get too many from one constituency, the object being to distribute these special samples as evenly as possible over the whole Dominion. It has not been possible to prepare for publication the results we have received, but it is hoped that this work may be overtaken before long.

I have with me some particulars of a few of the best results which have been reported by farmers in different sections which may be of interest. In Banner oats, Mr. James A. Hagen, of Sowerby, Algoma, reports that he raised from the Banner oats sent him a crop equal to 110 bushels to the acre. Mr. Alexander Mackenzie, of Campbellville, Halton Co., raised at the rate of 92 bushels and 22 pounds. Mr. George White, of Echo River, Algoma, reports 106 bushels 26 pounds per acre of the Improved Ligowo oat. In West Bruce Mr. M. L. Martin, of Glammis, reports 102 bushels 22 pounds per acre of the same variety.

*By Mr. Rogers:*

Q. What variety was that?

A. The Improved Ligowo. We have other reports regarding that variety. Mr. W. H. Pritchard, of Ripley, reports 77 bushels 32 pounds; Mr. Edward Prout, of Bowmanville, both East Durham, 104 bushels 14 pounds; Mr. Harry L. Wood, of St. Thomas, Elgin County, 120 bushels; in Huron West, Mr. Walter Hick reports a yield of 91 bushels 6 pounds, and Mr. George Scott, Wanbuno, Lambton County, 86 bushels 26 pounds per acre.

*By Mr. Calvert:*

Q. What quantity of seed did they have?

A. The quantity of oats was 8 pounds, sent in 2 bags of 4 pounds each; of barley and spring wheat, 10 pounds—2 bags of 5 pounds each. The number of varieties was limited to fourteen, six of oats, four of spring wheat and four of barley.

In Golden Giant, A. Addley, of Perth Road, Addington, reports a yield of 71 bushels 6 pounds per acre. In East Hastings, H. Bowen, of Deseronto, had 90 bushels, and in North Hastings, George Ryan, of Bird's Creek, had 95 bushels. In Bavarian oats, Thomas Duston, of Belmore, in East Bruce, reports 108 bushels 28 pounds. Of American Beauty, in Frontenac, Mr. W. H. Woodman, of St. Lawrence, had 96 bushels 16 pounds, and in the North Riding of Grey, James Lemon, of Walker's Falls, reports 79 bushels 14 pounds. William Ritchie, of East Riding of Bruce, reports 79 bushels 4 pounds. These are some of the best reports we have received, showing you how the varieties turn out when they get into good hands.

*By Mr. Rogers:*

Q. I know the Mr. Woodman you mentioned and he told me about that. He was very much pleased and will do what he can to distribute that seed in his section of the country as soon as he has sufficient; he is very much taken with it.

A. As showing how the work of the experimental farms is appreciated, I would like permission to read a letter as a sample which I got a few days ago from Carman, Manitoba, from Mr. William A. Finch. Many of such letters are received every year. He says:—

“CARMAN, MANITOBA, March 8, 1900.

“DEAR SIR,—I often think we farmers neglect a duty in not giving some of our experience in return for the valuable information furnished us by your reports and bulletins from time to time; for myself I can say they have been a great help to me financially, and this I consider is the chief lesson to learn.

“In hog feeding last season I bred three young sows, raised 24 pigs, average 150 lbs. in seven months, Yorkshire cross with Berk, made 185 lbs., fed barley chop and wheat cleanings with skimmed milk; these hogs with sows netted me \$280.00.

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"My potato crop will bring me something over \$120, and I also raised 40 bushels of onions which netted me \$42, carrots \$5, milk 12 to 15 cows, sold 1200 lbs. of butter, average price  $17\frac{1}{2}$  cents, hen fruit some \$40, besides a family of eight supplied, also 1,850 bushels of wheat, 560 of barley, 1,700 bushels of oats, from the seed which I obtained from the Experimental Farm (Banner oats). We work two teams, five horses altogether, hire one man at the harvest.

"I am one who thoroughly believes in mixed farming, a conclusion I came to some years ago in reading your literature which your department has kept me supplied with. Please accept my thanks for same and I trust the department will find more who will appreciate the work you and your staff have undertaken."

Hundreds of such letters could be produced if required, showing that the good seed sown is bringing forth fruit on all hands. With regard to the rapidity with which grain increases, I received a report a few days ago from Mr. O. Belanger, Chelmsford, Algoma, who received a three-pound sample of Banner oats four years ago, and this season he has threshed over 3,000 bushels, most of which he has for sale. That seems a large quantity, but it might have been much larger. Supposing the three-pound sample to have produced two bushels the first year, which is a low estimate, and 50 bushels per acre from subsequent sowings, sowing 2 bushels of seed per acre, the crop of the second year would be 50 bushels, which would sow 25 acres; continuing at the same rate the third year's crop would be 1,250 bushels, and the fourth year 31,250 bushels.

Q. What is the average weight per bushel of the Banner oat?

Q. It does not go much above the standard of 34. Ours this year ran about 37.

Q. Of course, the reports given are always by weight?

A. Yes, always by weight. The work on all the branch farms has progressed satisfactorily during the past year, and the crops have been good. Further experiments have been conducted at Nappan with the herd of milch cows, and experiments in the fattening of steers have been conducted at nearly all the farms, also experiments in the fattening of swine.

The uniform trial plots of all the more important farm crops have been continued and the results of these have been published in Bulletin 34. A large number of other useful experiments have also been conducted. The season at Agassiz, while fairly favourable for the growth of cereals and roots, has not been favourable for fruits. The very wet weather which prevailed in the spring extended all through the blossoming period and prevented the fruit from setting, and the crop has been very light. The trees, however, have made a thrifty growth and at present are full of promise for the coming year. At all the experimental farms much time and attention has been given during the past season to growing a great variety of products for the display now being set in order at Paris. These include a large number of varieties of cereals, fodder crops and grasses, also fruits and some vegetables. The material which has gone forward from the farms will form a very considerable and important contribution to the Canadian display.

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Having read over the foregoing transcripts of my evidence of the 21st and 22nd March, 1900, I find them correct.

WM. SAUNDERS.

*Director of the Dominion Experimental Farms.*





## POULTRY BREEDING AND PROFITS.

COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
THURSDAY, March 29, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 a.m., Mr. McMillan, Chairman, presiding.

Mr. A. G. GILBERT, manager of the poultry department at the Central experimental farm, was present by request of the Committee, and made the following statement:—

MR. CHAIRMAN AND GENTLEMEN OF THE COMMITTEE,—Allow me to express the pleasure I have in again meeting you. With your permission I shall call your attention to certain features in connection with my work of the past year.

First, I invite your attention to the continuation of the experiments showing the difference in the laying qualities of old hens and pullets, experiments which we undertook at the request of this committee a year ago and which were continued during the past winter.

Second, a slight reduction in the cost and quantity fed of the winter ration, and the excellent laying of certain breeds on that ration during January, February and March, the period of high prices.

Third, the successful fattening without forcing and sale at satisfactory prices, by farmers, of thoroughbred chickens, being the superior quality.

Fourth, some experiments along that line by ourselves.

Fifth, the demand springing up for the superior quality by Canadian shippers, and the consequent chance for our farmers to make money by supplying that particular quality.

Sixth, the discovery of a disease in Canada that has been fatal to a great number of turkeys in different parts of the country;

And, time permitting, I will call your attention to some experiments in obtaining a good preserving liquid for eggs.

Before entering on the discussion of these subjects, you will perhaps permit me to remark on the gratifying reception the extra number of copies of my evidence of last year, which your committee were kind enough to provide for distribution, met with in the country. In proof of this, I will ask your permission to read short extracts from two or three letters, out of many, which have been received. All of these go to show the increased interest that is being taken in poultry raising as a revenue making department of farm work.

The first is from Mr. Browne, of Picton, Ont., who says 'that through the courtesy of the member for his district he has received a copy of your evidence given before the Committee of Agriculture of the House of Commons. He finds it useful in showing the difference in the laying qualities of Minorcas and Leghorns. He thinks his Leghorn pullets did better than mine, but he would like to get a cockerel from the Black Minorcas which did so well.'

Mr. F. C. Hare, a well-known poultry expert of Whitby, Ontario, says: 'I have read your evidence before the committee on agriculture with great interest. There is no doubt about your statements *re* artificial incubation. It is desirable, if for no other reason than the freedom of chickens from lice; lice are the ruination of so many poultry establishments. Certainly hot air is superior to hot water for the reason that if the hot water tank starts to leak, disaster follows.'

A well-known member of this committee wrote me 'that it is wonderful how well the evidence takes. I am satisfied that just such work will do great good.'

Many farmers have written saying that 'we want eggs from those grand winter laying Barred Plymouth Rock pullets mentioned in your evidence before the committee.'

#### OLD HENS VS. PULLETS AS LAYERS.

I shall now go on to the experiments made in regard to the laying of hens *vs.* pullets. It has been a subject of much discussion in the poultry papers of the United States and among different agricultural colleges as to the merits of hens and pullets as winter egg layers, and it may be remembered that I undertook a series of experiments along that line at the instigation of this committee.

The experiment was begun and carried on during the winter of 1898 and 1899 and was to show as I have stated, the difference in the laying qualities of old hens and pullets. The experiment up to the end of May, 1899, showed that pullets laid, with one exception, (that of seven black Minorca hens) more eggs.

**Pullets.**—Of the number the Barred Plymouth Rock pullets laid the most eggs, 648; with eight white Leghorns second with 538, and the same number of white Plymouth Rock pullets third, with 526 eggs. It was also shown that while the pullets laid the most eggs, the eggs laid by the more mature hens were the heaviest. The experiment was continued during the recent winter months of December, January, February, and the present month of March up to the 20th, because after that date I had to make up the breeding pens and remove a portion of the hens from one part of the building to another. Only a portion of December is given for the reason that winter laying did not begin until nearly the middle of that month last year. The time of record is also shorter for the reason that I was not examined by your committee last year until the 22nd of June. However, the most important months are given, namely, portion of December, the full months of January and February and nearly all of the present month (March). These months are the most important, because they are the season of high prices.

**Hens.**—The total number of eggs laid by the yearling hens during December, January, February and a portion of March were as follows:—Eight Langshans laid 260 eggs; eight brown Leghorns laid 350 eggs; seven white Plymouth Rocks laid 236 eggs; eight Barred Plymouth Rocks laid 132 eggs; eight black Minorcas laid 286 eggs, and eight white Leghorns laid only 126 eggs. As compared with the results from the same hens as pullets the year before the showings in the case of the white Leghorns and the Minorcas and Plymouth Rocks are not so good, but in the case of the brown Leghorns and the Langshans the results are much better. The following table shows the eggs laid during the period of experiment from December of last year to 20th of present month, March, by the yearling hens, and the eggs laid by the same hens, when pullets, for the same period of the year previous:—

	Eggs Laid by Yearling Hens. 1899-1900.					By Same Hens When Pullets. 1898-1899.				
	December.	January.	February.	March.	Total.	December.	January.	February.	March.	Total.
8 White Leghorns .....	18	34	33	41	126	41	106	90	84	321
8 Black Minorcas .....	37	79	91	79	286	25	39	102	77	243
8 B. P. Rocks .....	..	44	38	50	132	91	119	88	131	429
7 White Do. ....	29	67	83	57	236	25	106	101	117	347
8 Langshans .....	10	103	83	64	260	4	35	42	55	136
8 Brown Leghorns .....	55	110	103	82	350	18	81	77	104	280



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In connection with the foregoing experiment certain points forced themselves on our attention, the most important of which was that the hens which laid well one winter did not do so well the succeeding winter. But we also found that if some breeds did not lay so well there were others which came to the fore as illustrated, in this case, by the Langshan hens and brown Leghorn pullets, so that we have the same amount of eggs laid, practically, and are pretty sure of having the same winter margin of profit. We calculate to make from \$1.75 to \$2.00 per annum per fowl, over and above the feeding expenses. We have succeeded in doing so for some years past. Although we have done so, I do not hold out to farmers figures calculated to mislead them. I hold out a margin of profit of \$1.00 per hen, which a farmer can make by going according to the instructions which we give them in our annual report as to management and feed and proper time to have their hens laying.

*By Hon. Mr. Perley:*

Q. Why can't the farmer do as well as you?

A. He can, but I do not hold out the same margin of profit as we make, because in the first place I am situated near a city market and I can get from 35 to 40 cents a dozen for eggs in the winter, which perhaps some farmers cannot obtain.

*By Mr. Burnett:*

Q. Is there no other reason, don't you sell eggs at \$1.00 a dozen for breeding?

A. Yes, but we do not sell as many now as we used to. That might be offset by the farmer converting a number of his eggs into poultry, to be sold at so much a pound.

In this connection I may say that three or four years ago, at the instigation of your committee, I conducted an experiment to show the profit that could be made in a year from fifty hens. In that case forty-one settings of eggs were sold for hatching purposes at \$1.00 per setting.

I told the committee at the time that I would have preferred, instead of selling these eggs for hatching at \$1.00 a dozen, to have turned them into poultry to sell to Montreal firms who told me that they would take all the superior poultry I, or the farmers, could give them at 10 cents a pound.

Q. Who were those firms?

A. Brown Bros., Harry Gatehouse, and Lamb of Lamb's Market. I give the figures to the farmers at the different Farmer's Institute meetings I attend, to induce them to breed the superior class of poultry and receive the higher price.

*By the Chairman:*

Q. What kind of poultry?

A. A superior quality of poultry, thoroughbred poultry, such as birds from the Plymouth Rock or Wyandotte breeds.

*By Mr. Wilson:*

Q. Sorts the farmers do not have, as a rule?

A. They are fast getting them now, sir. Birds such as will weigh 4 and 4½ pounds in four months, or 8½ pounds the pair in five months.

Q. Did the Montreal dealers stipulate any size the birds were to be?

A. Yes; they showed me birds they were receiving from different parts of the country which were from the nondescripts of the barnyard. They said some of them were not worth paying express charges on. They would like birds which would weigh 8 pounds a pair in four or five months, such as I had told them about. They distinctly stated that (at that date) their customers wanted and were willing to pay a higher price for good birds, but such quality as desired could not be got. An account of my visit to the Montreal dealers was appended to my 1896 report.

*By Mr. Burnett :*

Q. Before you leave that subject I would like to ask one thing. According to your statement I understand that the Plymouth Rock is a better layer than the White Leghorn?

A. I found the Plymouth Rock a superior all round fowl.

Q. As a layer?

A. As a pullet equally as good, but not as a hen.

Q. The general feeling in the country is that Leghorns are better layers?

A. Yes, I know; and so they are as hens, but as pullets there is very little difference. Our experiment of winter before last with pullets of different breeds shows that.

*By Mr. Rogers :*

Q. The Brown Leghorn is the best of all, though?

A. Yes; the Brown Leghorn certainly came to the fore last winter.

*By Senator Perley :*

#### BEST ALL ROUND BREEDS.

Q. What is the best hen for the farmer?

A. The Plymouth Rocks or Wyandottes. Both are excellent winter layers and rapid flesh formers. The White Leghorn is an egg machine, but it is not in it as a table fowl with the others named, and for that reason I recommend Plymouth Rocks and Wyandottes to the farmer, because when he has either breed he can kill the two birds, as it were, with one stone, in having winter layers and also good table fowls.

*By Mr. Burnett :*

Q. Is not the Wyandotte a very tender fowl?

A. We have not found them so. In some instances we have not found them as hardy a fowl as, for instance, Plymouth Rocks. The difference might have been due to strain.

*By Mr. Erb :*

Q. In estimating the profits on the hens do you make allowance for buildings, appliances and your own salary.

A. Not so far, for we have never had a complete poultry establishment, as is now understood. I mean that we have never had the artificial hatching and rearing of chickens conducted in proper apartments, but we are to have the proper rooms, I am informed, by the Minister of Agriculture. Before I make any such calculation as you speak about, I would like to be able to turn my winter eggs to the very best account by hatching early broilers. At present we make our money by having eggs in winter and hatching out chickens in summer. Some eggs are sold for hatching purposes.

*By Mr. Wilson :*

Q. What are the items you include?

A. At present our work is conducted so as to instruct the farmers in an elementary way. First, to have their hens lay in winter so as to sell the eggs at high prices, and in spring hatch out chickens by hens as early as possible and to have the superior quality of poultry for home or foreign markets.

Q. But in counting the cost of eggs per dozen, what items do you include?

A. The cost of feed and the man's wages.

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Q. And what do you make out the cost?

A. Calculating the cost of a hen per year for food at 75 cents and the man's time, our hens make from 75 cents to \$1 per year profit.

Q. But what is that per dozen?

A. I cannot say exactly at the moment; perhaps about 7 cents a dozen.

*By Mr. Bell (Pictou):*

Q. Do you mean to say that it is more profitable to hatch eggs and rear broilers than to sell at \$1 a dozen for setting?

A. They are two distinct branches of the business. You may have fowls to lay eggs to sell at winter figures and others to lay eggs for artificial incubation. There is a very large establishment in Toronto conducted on these lines. In that establishment you will find that the hens which lay in winter the eggs to be sold in the Toronto market for 35 and 40 cents a dozen, are not the hens which lay the eggs to be put in the incubators. Let me illustrate. A dozen eggs sell in December, in Toronto, at 35 cents for eating purposes. Say the manager of the poultry establishment at the same time puts another dozen of eggs into an incubator and hatches out eight chickens, to be sold for early broilers. Allow two chicks to go to pay for the rearing of the remaining six chicks to the age of ten or twelve weeks old, when he will sell them at \$1.25 or \$1.50 per pair. He will thus make the dozen eggs worth \$3.75 or \$4.50, as compared with 35 cents for the dozen sold for eating purposes.

*By Mr. Wilson:*

Q. I do not know where he would sell chickens for that?

A. In Montreal. We had early broilers sell in our Ottawa market here for \$1.50 last spring for the first time.

*By Mr. Talbot:*

Q. Have you made any estimate of the loss of chickens before they mature?

A. I would consider five per cent an average loss.

Q. And not more?

A. I would consider ten per cent a very serious loss.

*By Mr. Rutherford:*

Q. On your farm the loss would be much less than in an ordinary farm-yard?

A. Perhaps so, sir. But I have always recommended in my reports that the farmers should take more care of their chickens, particularly the early ones, than they do. When I hatch chickens by hens, I prefer to have them out in May. I think that the May-hatched chickens will do better with farmers than any others, because they will grow up with the grass. If you hatch them out earlier they have to be kept artificially, somewhere about the house, and loss follows. But take the mother hen and brood and put them in a coop on the grass outside; feed properly, according to the methods I have given in my reports from year to year, and there should not be a greater loss than I have had. The year before last, I think it was, we hatched out 196 chickens and raised 188 of the number.

*By Mr. Erb:*

Q. How many did you hatch?

A. 196.

Q. And reared 188?

A. Yes. To relate another experiment I may say that when I was, comparatively speaking, an amateur—before I accepted the position I am now in—I raised, on one occasion, 183 chickens out of 186. After all it is a matter of care, particularly during the first four or five weeks of the chicken's life.



*By Mr. Bell :*

Q. How much do the early broilers weigh ?

A. From two and a quarter to two and one-half pounds each in ten weeks. In three months they ought to weigh five pounds per pair, perhaps a little more or a little less.

Q. A pair ?

A. Yes. They are not large. They are sold in large cities principally for restaurant and club use.

Q. That is at 30 cents a pound ?

A. Yes. They bring as high as 35 or 40 cents a pound at times.

*By Mr. Sproule :*

Q. At what season of the year would they sell at that price ?

A. In large establishments they start their incubators in January, sometimes in December, so as to get the early broilers on the market in the middle of March.

*By Mr. Burnett :*

Q. Don't you find there is more mortality in the young chickens of the Wyandottes than with the others ?

A. We did with the White Wyandottes one year.

Q. Farmers find them very hard to rear ?

A. There is a great deal in the matter of strain. There are some strains constitutionally weakened by being inbred from year to year for show purposes. I would advise farmers never to buy eggs from such strains, but rather to buy from another farmer who has a robust strain of good layers.

#### DECREASE IN COST OF RATION.

I wish now to speak of a slight decrease in the cost of the rations of the recent winter we succeeded in making, and a result of the rations. I was asked last year by a member of your committee if I had reached the minimum cost of rations with the maximum of output. I had not at that time, and I now wish to show wherein I have made the reduction. It has always been my aim to obtain the maximum output at the least cost, and the saving during the past winter was made in obtaining the cut bone at one-half cent per pound instead of one cent as heretofore. And as cut bone was only fed three times per week the saving was made actually upon a portion of the rations only. But although small it was a saving and was welcome. During the winter of 1898-9, mash and a little cut bone were fed to the pullets every day until the end of January, when it was found that the young birds were becoming too fat and the quantity was reduced, as were the times of feeding. Profiting by that experience, this winter it was determined to feed the yearling hens—our older hens had been disposed of by sale—and pullets the same quantity and number of times, viz.: Mash three mornings or afternoons of the week and cut bone the other days on which the mash was not fed.

#### COMPOSITION OF RATIONS.

One day's ration of the recent winter for two hundred hens, (one hundred hens and ninety-nine pullets) would be composed and cost as follows:—

13 pounds mash, fed in the proportion of  $6\frac{1}{2}$  pounds to one hundred fowls, 13 cents.

13 pounds of wheat, fed in the same proportion, 15 cents.

10 pounds of oats, scattered in the litter of the pens for the purpose of stimulating exercise, 8 cents.

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Vegetables and grit, 5 cents.

A total of 41 cents. The other day's ration was composed and cost as follows :—

13 pounds cut bone, fed in the proportion of about 1 pound to fifteen fowls,  $6\frac{1}{2}$  cents.

13 pounds of wheat, fed in the proportion of  $6\frac{1}{2}$  pounds to one hundred fowls, 15 cents.

10 pounds of oats, scattered in the pens, 8 cents.

Vegetables and grit, 5 cents.

Total of  $34\frac{1}{2}$  cents.

The cost of the rations for the winter previous, 1898-9, was  $42\frac{3}{4}$  cents for one day and  $41\frac{1}{4}$  cents for the other. It was fed to one hundred and fifty-one hens and fifty-three pullets. Compared with the above the cut bone ration shows a reduction of from 7 to 8 cents.

*By Mr. Wilson:*

Q. That is on the whole lot of hens?

A. Yes, on the whole lot. It is quite possible that a further reduction can be made in the quantity of oats scattered in the pens to incite the fowls to exercise. My opinion is that half the quantity of oats can be made to do, provided the young birds have been accustomed to exercise from the time of going into winter quarters. And if a farmer had his unmarketable grains ground up, to make into mash, the cost to him should be less than the figures I have named.

Every effort is being made to find a substitute for cut green bone, which is not always convenient for farmers to obtain, particularly those who are far-away from the cities and towns. And this brings to mind the fact that farmers in the neighbourhood of cities and towns have opportunities that the far away farmer has not. The farmer who is near a city or live town has a chance to obtain a better price for his eggs and poultry and can afford to purchase green bone at a half cent, or, one cent per pound, and even to buy his grit and oyster shells, forms of poultry requisites that are sold cheaply. Meat, in some shape or form, to take the place of the insect life the fowls pick up for themselves when running at large, seems almost indispensable to the winter production of eggs, and in what shape it can best be supplied to a far-away farmer, or, what is the best substitute is the problem that we are now trying to solve, and it is a very important one.

## EFFECT OF THE REDUCED RATION.

That the effect of the reduced ration was not detrimental is shown by a table which I have prepared of the daily egg output. With your permission, Mr. Chairman, I shall read you the totals and let the detailed account go in to show the results. Totals are for the months of January, February up to March 20. Eight Brown Leghorn hens laid for the two and a half months two hundred and ninety-five eggs.

Nine Brown Leghorn pullets laid three hundred and eleven eggs.

Eight Black Minorca hens laid 249 eggs.

Nine Black Minorca pullets laid three hundred and thirty-three eggs.

Eight White Leghorn pullets laid three hundred and nine eggs.

Eight Langshan hens laid two hundred and fifty-one eggs.

Eight Wyandotte pullets laid two hundred and thirty-seven eggs. The following is the table:—





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The above table shows that on several days in the winter months the brown and white Leghorn pullets and hens, numbering eight and nine in a pen, laid six eggs, and so did the black Minorca hens and pullets. On several days we had seven eggs from nine black Minorca pullets. Four, five and six eggs per day from all the breeds named and numbering eight and nine in a pen is remarkable laying in the winter months of January and February. Eight white Wyandotte pullets did equally well, giving in one day in January seven eggs and frequently five and six eggs per day. The foregoing will show that the feeding of the mash in the afternoon rather than the morning, and cut bone three times per week, and both in the quantities already named, was certainly beneficial, as far as the above fowls are concerned, at any rate.

Our experience so far goes to show that some breeds do better during some winters than others. Some breeds, such as Plymouth Rocks, Wyandottes, Andalusians, Minorcas and Leghorns are as a rule good winter layers. In the past winter we were surprised and gratified at eight Langshan hens, which had not done well the previous winter, making a very creditable showing.

*By Mr. Rogers :*

Q. There are no white Plymouth Rocks there ?

A. The White Plymouth Rocks did not do as well with us last winter as they usually do.

## THE QUESTION OF THE PROPER QUANTITY OF RATIONS TO FEED.

While on the subject of rations and the quantities fed to our laying stock, matters of very great importance, I beg to read the following extract from a letter written by an esteemed correspondent at Halifax, on this point and which I think is important enough to bring to the notice of your committee. My correspondent says: 'I cannot imagine how you can get fowls to lay on the quantity of rations mentioned in your report unless it is the bone and meat that supply the necessary food for eggs. I could not keep fowls on the rations of one pound to fifteen hens, they would be nearly starved, especially the Minorcas. I have kept poultry for years. A few seasons since I had as many as 450 laying hens and 500 chickens, and collected 39,600 eggs.'

Another correspondent, a clergyman, says much the same, as to the quantity of mash fed three times per week. He thinks however that the artificial heating of my poultry houses may be a factor in my getting so many hens to lay in winter. Now here on one side we have a doubt as to the proper quantity of mash, or other rations and on the other hand the statement which I have just submitted to your committee, showing that on the quantities of rations, as advised in my reports, we had seven eggs on several days during the winter from nine pullets and frequently six eggs from the same number. Hens also did good laying, and it so happens that the best of our layers last winter were of the Mediterranean breed, to which the black Minorcas belong, and which my Halifax correspondent says would not lay with him, but would starve on my rations.

The question now arises whether would it be good policy to force pullets to lay better than our nine pullets and hens did when seven of their number laid on the same day? I think not. Would it not be very much like thrashing a horse that is going at his very best to make him do better? It is to be remembered that pullets will stand more forcing than older hens.

## TEMPERATURE OF POULTRY HOUSE.

As my second correspondent states, heat is certainly a factor, for we are told that the produce of the cow or hen is the result of the surplus of the ration over and above what is necessary to nourish and warm the animal, and that animals kept in a cold place require a greater quantity of food before milk, eggs, or fat, can be obtained. But under any circumstances, I should say that 35° to 40° are plenty

warm enough for a poultry house. In fact, many poultrymen of experience have stated with no uncertain sound that they consider  $60^{\circ}$  to  $70^{\circ}$  of heat would simply be death to their poultry, and I believe it. During the winter our poultry houses are frequently below the freezing point, and on the floors, where our hens are, the temperature is not any warmer than it should be, and yet I have numerous letters from correspondents who say that 'our poultry house is warm and yet the hens do not lay.' Indeed, there are several factors in winter laying which have to be thoroughly known and appreciated, and he or she who undertakes to obtain eggs from their hens must—like he or she who obtains the pound of gilt-edged butter—know how to proceed in order to gain the desired results. The efforts of all advanced poultry keepers, and, indeed, of keepers of all kinds of stock, are devoted to obtaining the maximum output at the minimum of cost. I have brought this matter to your notice because it is one of very great importance, and it is as well to meet any question of doubt, such as I have mentioned, fairly and squarely at the outset, and let the country have the benefit of the points I have brought out.

*By Mr. Rutherford:*

Q. Before leaving that point I would like to ask you: In keeping hens in winter quarters—I quite agree with you as to the temperature, for I do not think in any case it should be over  $40^{\circ}$ —some people have a habit, when it is a nice morning, of letting the hens outside to enjoy the sunshine. My experience is that whenever this is done, for the next day, and for a few days afterwards, there are no eggs?

A. That is my experience also.

*By Mr. Burnett:*

Q. What is the cause of that?

A. On such days in winter the sun may be shining very brightly and yet the wind be very keen and penetrating.

*By Mr. Wilson:*

Q. But does it take effect the very next day?

A. It takes effect very rapidly. The hens get a shock, as it were, from the cold. Perhaps the effect may not be felt the next day, but it is in two or three days afterwards.

Q. I wonder at it having effect so soon?

*By Mr. Rutherford:*

Q. It is a well known fact that a hen may have a great many eggs inside of her and yet not lay.

*By Mr. Burnett:*

Q. I should think she would have no choice?

A. Dr. Mills of McGill University has answered that. His reply was in relation to the singular fact that a hen, although apparently full of eggs, will suddenly stop laying. Take, for instance, a hen from one house to another that is strange to her and she will stop laying for a few days. You would be surprised at the number of inquiries I have received on the point as to whether it would be good policy to allow hens to run out on a bright shiny day in winter or not. In our case it would be impossible, for our houses are surrounded by five or six feet of snow drifts most of the winter. If they were let out the hens would be sure to get chilled.

*By Mr. Wilson:*

Q. But if you only let them out two hours in the middle of the day when it is warm would it do any harm?

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A. They would have to go into the snow, and that would not have a good effect. It may be peculiar, but it is true that any treatment which lowers the vitality, if it is only for a short time, has such an effect on the hen that the egg production is lessened. Farmers tell us at the Institute meetings that a cow should be treated kindly, for the reason that such kindness pays in an increase of the milk flow. It pays to treat your poultry with consideration. If a man is rough about the poultry house, from a money making standpoint it will pay to get rid of that man as quickly as possible.

*By Mr. Erb:*

Q. As to letting the hens out, that all depends on circumstances. A farmer may have his barn arranged in such a manner that when the hens are let out they get immediately into the barn-yard on the manure, or into an open shed where there is straw or chaff. On a fine day in such a shed, particularly where there is a southern exposure, it is all right. In such a case I think it is a benefit to allow them out in fine weather.

A. I was in the Eastern Townships lately and stayed at a house where a man kept poultry successfully in winter. He had a large empty shed with a southern face. Into this shed the sun would shine on fine winter days, and it was a comparatively warm place. He said that he frequently let the hens into this shed and they profited by it. In his case, the conditions were favourable, but the conditions with us are certainly different.

MR. RUTHERFORD.—I look at the question from a practical point of view. I keep hens myself and am speaking from experience. If you keep hens in a house carefully preserved from wind and weather at a comfortable temperature, and then in the goodness of your heart you let the hens out on a sunny morning. An ordinary farmer does not think very much of his hens as a rule, and he may not be careful to put them in again when the sun leaves the yard. It gets cold in the afternoon, your hens get chilled and go to roost so shocked in their whole system that you get no eggs for a couple of days or longer. In that way the egg production is lowered and the profit for the year made less.

MR. BURNETT.—All the same that has been the custom.

## WEIGHT OF HENS' AND PULLETS' EGGS.

MR. GILBERT.—When I was before your Committee last year I was asked by a member to show the difference in the weight of eggs laid by pullets and hens. I weighed the eggs of both and this is the result:—

	Hens.				Pullets.			
	Lbs.	Oz.		Lbs.	Oz.	Lbs.	Oz.	
Barred Plymouth Rocks.....	1	9	to	1	12	1	5	to 1 6
Wyandottes.....	1	9	"	1	10	1	4	" 1 6
White Leghorns.....	1	10	"	1	11	1	6½	" 1 7½
Brown ".....	1	9	"			1	4	" 1 5
Black Minorcas.....	1	12	"	1	13	1	7	"
Andalusians.....	1	11	"	1	12			
Light Brahmas.....	1	9½	"	1	13			



*By Mr. Sproule :*

Q. Is it not a fact that the black coloured fowl, as a rule, lays the larger eggs ?

A. The Black Minorcas and the Black Spanish certainly lay the largest eggs. The Andalusians and some strains of White Leghorn, closely follow. Two or three years ago, we had a strain of Black Minorca hens, the eggs from several of which went six to a pound and the majority of them went seven to a pound. They were an unusually large egg laying strain. I had also a strain of White Leghorn which laid remarkably large eggs. The great majority of the Leghorn eggs went seven or eight to a pound.

#### REARING, FATTENING AND SALE OF THOROUGHbred POULTRY.

Any instances of successful work in the rearing, fattening and disposal of the superior quality of poultry flesh by farmers will I am sure, be received with satisfaction by your Committee. It is therefore with much pleasure that I bring to your notice the following instances of success in so doing by the farmers themselves. I should say that last year, upon my suggestion, Mr. McPhadden, of Dominionville, Ontario, the writer of the first letter I will submit to you, procured Barred Plymouth Rocks. This year he wrote regarding the proper method to adopt in the fattening of his chickens. His first letter is as follows :—

‘ DOMINIONVILLE, ONT., 25th September, 1899.

‘ MR. A. G. GILBERT,  
‘ Experimental Farm,  
‘ Ottawa.

‘ DEAR SIR,—I write you concerning poultry matters. The question I want answered is the best way to fatten and dispose of a number of Barred Rock chickens. Their ages now are about four months. I have read up all about the fattening of chickens, that has been written in the farmers’ papers, and I am still at a loss to tell which is the best way. I think that cooping them up will not work without the forcing process. There are the two remaining ways then of fattening, viz.: Confining them in yards, or letting them run at large. Now as you have had some experience, you will be able to give me a decided answer.

‘ Supposing I succeed in getting a number of good fat chickens what would be the best way to dispose of them ? As it costs more than five cents per pound to produce chicken flesh I will not dispose of them as I did last year, selling to a country store-keeper at 5 cents per pound. Now, if I thought that 9 or 10 cents per pound could be secured for plump chickens I would be able to fatten a number. I shall consider it a great favour to hear from you concerning this matter.

‘ Respectfully yours,

‘ ALEXANDER McPHADDEN.’

My reply was to get the superior quality of chicken flesh and I would then endeavour to get a market for him. I advised putting the chickens into a pen with, perhaps limited run and feeding them twice or thrice per day regularly on two parts of finely ground oats, one part shorts, and one of corn meal and to report results. No forcing machine was necessary in the case of such chicks as he had.

The next letter from him is dated October 23, and he writes :

‘ DEAR SIR,—I am now fattening Barred Plymouth Rock chickens in crates as suggested by you. I did not have a suitable place to pen them up in so I decided to try the crate plan. Two weeks ago I started with eight chickens weighing from 5 to 5½ pounds apiece, feeding them meal mixture as directed. The first week’s gain was one pound per chick, the second week’s gain one half pound or thereabouts, so

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you may see that I have a number of chickens weighing over seven pounds, apiece. I have not kept an exact account of the food they have eaten, but I don't think it would be over 1 pound of meal a day and skimmed milk. I shall begin to feed the tallow this week. I have twenty-six chickens fattening and will have more later on. I bought a few, paying from 45 to 50 cents per pair all pure bred Barred Rocks. I would not be bothered with any other kind if I could get enough of them. Ordinary scrub chickens are selling at 30 cents per pair.

'I expect to have in about three weeks time my first dozen chicks ready to ship. I shall look to you for a few suggestions in that line.

'A. McPHADDEN.'

*By Mr Winchester :*

Q. What kind were selling at 30 cents ?

A. Ordinary scrub chickens.

Q. What price did Mr. McPhadden get ?

A. He hadn't fattened his chicks yet, but when he did he sold at 10 cents per pound.

## FATTENING RATIONS AND COST.

I answered his letter by asking for further particulars. I said I would like to read his letter to the Committee on Agriculture to show the development of thorough-bred chickens in the hands of farmers.

He wrote in reply :

'DEAR SIR,—In answer to your enquiry regarding the exact figures in the fattening of the chickens I may say they are as follows to the best of my knowledge:—

'1st week 8 chicks consumed 25 lbs. meal, 35 lbs. milk.

'2nd " 8 " 22 " 30 "

'3rd " 8 " 18 " 20 "

'Total gain 1st week 7 lbs., or  $\frac{7}{8}$  lb. per chick.

" 2nd " 4 "  $\frac{1}{2}$  "

" 3rd " 2 $\frac{3}{8}$  "  $\frac{1}{3}$  "

'Cost of producing one pound weight is about 5 $\frac{2}{5}$  cents.

'The meal is worth 1 cent per pound and the skimmed milk is worth 15 cents per 100 pounds.

'The meal fed the first week was, by weight, three parts oats and one part pease.

'The second week's feed was the same as the first with some corn meal added. In the third week the corn meal was increased.

'The foregoing statement may not be absolutely correct, but for all practical purposes I think it will do.

'The experience I have had so far as the first three weeks is concerned in the fattening of the chickens is highly satisfactory.

'There has not been one sick chick in the lot of twenty-six as yet.

'The crates are made of common building lath 4 feet long, divided into two compartments with the bottom lath planed, four chicks in each compartment. The crates are in an open shed now and I have noticed on one or two cold mornings the droppings froze to the bottom of the crates.

'When the weather gets cold and frosty I shall move the crates into one end of the hen house. I intend to place five or six pair in the crates to-day, and if success warrants the undertaking I will place more in them.

'Yours very truly,

'A. McPHADDEN.'

I wrote in reply to send me four chickens when he thought they were ready, and I also gave him the names of Montreal dealers who would give him 10 cents per

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pound for his birds. He accordingly sent me four large and well fattened chickens which weighed respectively 6 lbs. 13½ oz., 6 lbs. 12 oz., 6 lbs. 11½ oz., and 6 lbs. 9 oz. I need not assure you that they made excellent eating and were well worth 10 cents per pound. He subsequently sent to me a further shipment of ten birds which weighed singly 5 lbs. 6 oz., 6 lbs. 2¾ oz., 5 lbs. 13¼ oz., 6 lbs. 5¾ oz., 5 lbs. 12¾ oz., 5 lbs. 14 oz., 5 lbs. 4 oz., 5 lbs. 9¾ oz., 6 lbs. 14¾ oz., 4 lbs. 14¼ oz. The total weight of the ten chickens was 58 lbs. ¾ oz. They were sold for 10 cents per pound. Such chickens would have been snapped up on the English market. Mr. McPhadden, on receiving his money, wrote to me that the whole transaction was entirely satisfactory to him.

*By Mr. Wilson:*

Q. Does he tell you how old the birds were?

A. At that time they must have been six and a-half months old, because some of them were four and five and a-half months old when he got them. You will, however, see the success he made of his venture. It paid this farmer, although it was his first effort, because he procured the right breed to start with. You see his *modus*. He simply crated them up and fed them on the ground mash.

*By Mr. Rogers:*

Q. Do you always feed them ground grain?

A. Yes. His letter of acknowledgment reads:

‘DEAR SIR,—I must thank you for the help you have given me in the disposal of my chickens. Results have been very satisfactory. Yours respectfully,

‘A. McPHADDEN.’

Here is another letter from a farmer along the same lines. Permit me to say that I consider it very important to have the farmers first get the breeds which make rapid development; then to fatten them, so as to make the greatest weight and finally to sell at the best city prices. Mr. James Laidlaw, a well-known and enterprising farmer in the neighbourhood of Guelph, writes:

‘GUELPH, October 17, 1899.

‘DEAR SIR,—I want a little information about fitting a bunch of cockerels for market, and the very best market. They are Barred and Buff Rocks and Silver Laced Wyandottes; are running at large yet, but are in fine condition, weighing from 4½ to 5½ pounds, and some as high as 7 and 8 pounds as they run. When is the best time to have them ready for British, or any other good market? Could have about fifty ready in a few weeks, or whenever you thought it best, but as that number would not be quite enough to send alone, what is best to do? Are you sending any? If so, perhaps you could take charge of mine and give me full instructions about packing, &c. I have read your instructions in *Poultry Review* and other papers.

‘Yours truly,

‘JAMES LAIDLAW, Jr.’

The following letter shows that Mr. Laidlaw sold in the home market at paying figures. He also expresses the opinion, which I consider most important, that thoroughbred poultry breeding pays as well as any department of farm work.

‘GUELPH, ONT., October 28, 1899.

‘DEAR SIR,—Yours of the 24th in reply to my inquiry *re* a market for poultry received last night. Was pleased to hear from you and to receive advice in answer



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to my inquiry. In keeping with your request to send you six cockerels this morning, closed up that number of suitable birds and weighed them, with the intention of feeding them hard for a week or ten days, and then forwarding them to you. They were weighed very empty, having had no breakfast, and their average weights were: Wyandottes,  $5\frac{1}{2}$  pounds, and Barred Plymouth Rocks,  $5\frac{1}{2}$  pounds. Intended weighing them again before shipping and noting the exact gain, thinking it might be of some use to me afterwards. I may say that I have sold all the Barred Rock, Silver-Laced Wyandotte and Buff Rock cockerels, that I can spare, to a party who is shipping them out west. He takes them in ten days or two weeks. He takes all I have that are fit, at a good deal better price than the markets here would give, and without the work of dressing them. I am very much obliged to you for the very prompt manner in which you went to work to find me a market for surplus stock. As a farmer I appreciate very much the interest you are taking in a branch of farm stock that is, to put it mildly, very much neglected, and which I am fully satisfied is equally as profitable as any other line of stock, with the same attention and conditions. Again thanking you for the trouble you have taken to help me along in the poultry line, I remain, yours truly,

‘JAMES LAIDLAW, Jr.’

This is the second statement of the kind I have read. It will be remembered that Mr. McPhadden said about the same thing. Coming from farmers, no better testimony can be desired. In my second letter, I advised him to try and sell on the home market, which he did, but if he preferred, to sell for shipment to the British market. I get frequent letters asking for the names of firms in Canada, who are buying poultry for shipment. Such parties will do well to communicate with the following shippers of poultry from Ontario, whose names were kindly furnished me by the Commissioner of Agriculture and Dairying, Prof. J. W. Robertson:—

The King Darrel Produce Co., Toronto.

Ingersoll Packing Co., Ingersoll.

H. J. Colwell, Arthur, Ont.

Booth & Co., Trenton.

J. E. Hawcroft, London.

R. Winter, Seaforth.

M. & W. Schell, Woodstock.

T. L. Turnbull, Glanbrassil.

Dundas & Flavelle Bros., Lindsay.

D. Gunn Bros. & Co., Toronto.

## EXPERIMENTS IN FATTENING THOROUGHBREDS AND CROSSES.

I now give you some experiments made last fall in fattening thoroughbreds and crossbred chickens by ourselves. I have read to you from their own letters proof of how successful farmers have been in hatching, rearing and fattening, with comparatively little effort, a number of thoroughbred chickens, which were sold at satisfactory prices. You have also heard their opinion as to the superiority of thoroughbreds over scrubs and the value of the poultry department to the farmer as a revenue maker. I shall now call your attention and briefly to some experiments conducted in the way of fattening thoroughbred and cross bred chickens in as simple and convenient a manner as possible. On August 15 last, 1899, three groups of five birds each, namely,—

5 Barred Plymouth Rocks,

5 White Plymouth rocks, and

5 Silver Laced Wyandottes

were selected and put into separate pens, in one of our poultry houses, with a limited outside run. Each bird had a leg band with a distinguishing number.

No. 1 group of 5 Barred Plymouth Rocks were fed, three times per day, solely on whole grain, in the proportion of two parts wheat, one of barley and one of corn.

No. 2 group of 5 White Plymouth Rocks were fed three times per day on mash. The same grains as fed to No. 1 group were ground up and made into mash.

No. 3 group of Silver Laced Wyandottes were fed on the ordinary rations given to chickens, namely, mash twice per day and whole grain for the last feed.

After feeding the three groups of chickens for two or three days, it was noticed that no more food was consumed than three-quarters of a pound daily by each group. We desired to feed no more than was absolutely needed. The amount of ration was accordingly limited to four ounces to each group, three times per day, or twelve ounces to each group per day. The value of the twelve ounces, or three-quarters of a pound ration per day, was placed at one cent for each group of five birds, or three cents a day for the fifteen birds. The amount of one cent per day for cost of food for five birds was thought to be very small, but it was corroborated by the figures shown in the experiment with fifty hens conducted three years ago by request of your Committee. That experiment, you may remember, showed that the fifty hens were kept in winter for 10 cents per day, or at 1 cent per day for every five fowls.

Full particulars of the gain per week made by each bird will appear in my annual report when published, so that it will only be necessary to give the total gains made in each group in the fourteen weeks the experiment lasted, and which are as follows:—

No. 1 group of five Barred Plymouth Rocks fed on whole grain made a gain of 18 pounds,  $12\frac{3}{4}$  ounces.

No. 2 group of five White Plymouth Rocks, fed on the same grain as given to No. 1 group, but ground finely and fed in the shape of mash, gained 20 pounds,  $3\frac{1}{2}$  ounces.

No. 3 group of five Silver Laced Wyandottes, fed on the ration usually fed to our chickens, namely, mash twice and whole grain once per day, made a gain of 15 pounds,  $4\frac{1}{4}$  ounces.

At the end of the tenth week the birds were allowed an unlimited run, in a large field, and they made, in the majority of cases, better progress than they did in the limited runs.

One of the results of the experiment went to show that the chickens fed on mash made the most gain, and that the gain in weight more than compensated for the extra expense entailed in grinding the grain. I talked the matter over with Mr. Grisdale, our Agriculturist, and we figured it out that the cost in the case of No. 1 group was  $5\frac{1}{4}$  or  $5\frac{1}{2}$  cents per pound of the gain, and that the cost of 1 pound of increased weight made by the same grains ground fine and mixed into mash, fed to No. 2 group was  $4\frac{1}{2}$  cents per pound. There is a saving of 8 per cent, which is more than enough to pay for grinding the whole grain into fine meal. I think it was a gentleman of this Committee who suggested that this experiment should be made.

#### COMPARATIVE FATTENING QUALITIES OF DIFFERENT BREEDS.

Another experiment was made with twelve crossbred cockerels, namely nine Plymouth Rock-Leghorn crosses; one light Brahma-Plymouth Rock cross; one White Wyandotte-light Brahma cross, and one Andalusian cross. The birds were penned up in the regulation small fattening pens, with slatted bottoms and feeding troughs in front. Each coop contained a single bird. They were fed on the ordinary mash given to the laying stock. The object of the experiment was to find what progress these first crosses could make in flesh development without any specially prepared ration, or extra effort, beyond cooping them up and feeding them three times per day on all they could eat. Some people hold that scrub chickens make as great progress and as great weight as thoroughbred chickens, but we have found out they do not. But these you will remember were first crosses, nine of them of Barred Plymouth Rock and Leghorn, and are not to be confounded with nondescripts. The birds were fed for four weeks and the best gain was made by the Plymouth Rock-Leghorn cross, of which No. 1 gained 1 pound,  $4\frac{1}{2}$  ounces; No. 6, 1 pound 1 ounce;



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No. 7, 1 pound, 1 ounce; No. 7, 1 pound,  $7\frac{1}{2}$  ounces, and No. 8, 1 pound,  $1\frac{1}{2}$  ounces. The least gain made in this group was by No. 2, viz.,  $12\frac{3}{4}$  ounces. No. 10, Light Brahma-Plymouth Rock cross made the best gain of any, 2 pounds,  $\frac{1}{2}$  ounce; No. 11, White Wyandotte-Light Brahma cross made a gain of 1 pound, 5 ounces. The birds made very satisfactory market chickens. Their weight development was also very satisfactory as the following will show: At the age of five months and eleven days Nos. 5, 4, 7 and 9, of the Plymouth Rock-Leghorn cross, weighed respectively 5 pounds  $5\frac{1}{2}$  ounces; 5 pounds,  $4\frac{3}{4}$  ounces; and 5 pounds, 5 ounces, representing a gain of 1 pound per month from the time they were hatched. These chickens were hatched and reared by hens. At six months and five days of age, the Light Brahma-Plymouth Cross showed a weight of 6 pounds  $6\frac{3}{4}$  ounces. The last chicken, with a number of others, was hatched by incubator and raised in brooder, and their satisfactory growth and development go to show that, artificially hatched and reared chickens, do as well as those hatched and fostered by their natural mothers.

## CHOICE OF BREED FOR MARKETING.

While these first crossbred chickens made excellent market fowls, the experience of past years leads to the conclusion that, while certain first crosses may do nearly as well as the thoroughbred Plymouth Rocks or Wyandottes, it is better for farmers to make a first choice of thoroughbreds and keep only one breed. To make a first cross necessitates the keeping of two breeds, and unless the cross was made every year, it would quickly degenerate into nondescripts. During last fall I had the pleasure of a visit from Mr. Silverwood, an English expert in fattening, killing and dressing poultry, &c., who was in the employ of Messrs. Dundas and Flavelle, of Lindsay, Ont. He had purchased during the summer many thoroughbred chickens from the farmers at five and a half and six months of age and then fattened, killed and shipped them to the English market. He said that I was perfectly right in my statement made in past reports and in my evidence before your Committee, that Plymouth Rocks and Wyandottes are the best chickens for the farmer. His experience led him to the same conclusions as to their being rapid flesh forming and very hardy chickens. He had followed my advice in recommending these breeds to the farmers and he found the result to his advantage.

Mr. J. F. Riddell of Wilsonville, Ontario, writes under the date of October 17, last:—‘An English gentleman is putting a large sum of money in the Brantford Co-operative Pork Packing Company. He is also a dealer in dressed poultry and would like to get some one to ship him a case of dressed poultry after the weather becomes colder. He said he would write to me. Is there not quite a risk in doing this? I have some grand birds that would be handy to fatten if I was sure of success.’ I replied ‘that in his case, where he was responding to a demand right at his door, there would be little risk if he would only fill the requirements, and that the attempt was certainly worth making.’ In passing I may remark that Mr. J. M. Wilson, expert manager of the Toronto Poultry and Garden Produce Company, asked me in a letter of February 19, last, the following:—‘Where can I buy ten thousand or twenty thousand young fowl to fatten? I am desirous of being able to buy that number, but I am afraid I may not be able to buy the right kind in this district.’

The foregoing shows there is actually a demand that farmers are not yet prepared to fill. At Farmer’s Institute meetings in different parts of the country I have urged upon farmers to be prepared, by having the proper breeds, for the demand for birds to fatten for shipment to the British market. Here is the demand actually upon us. Surely I was warranted in holding the inducements I did to the farmers. Briefly summarized my instructions to farmers in regard to the producing of the larger chickens were:—

1. To keep the thoroughbreds which make the large chickens, namely: Plymouth Rocks, Wyandottes, Brahmas, Cochins, Dorkings, with preference for the first two.

2. That in order to have the large chickens at the end of four or five months, they must be carefully looked after and regularly fed from the time of leaving the



nest. Particularly so, during the first five weeks of the chicken's life. Experience has shown that chickens neglected during that period of their lives, never make satisfactory market fowls, or early layers. (Hear, hear.) Why? Because during the term of life named, there is not only a drain on the vitality of the chick for bone, sinew, and muscle, but also for the rapidly growing feathers. When it is desired to fatten them at four and a half, five or five and a half months old they may be cooped up and fed as described by Mr. McPhadden in his letter which I read in the forepart of my evidence.

#### THE SITTERS AND THEIR MANAGEMENT.

I have received several inquiries as to sitters and their management, and as it will possibly be of use to poultry breeders, I will mention the following rules to follow:—

For an early sitter select a hen of medium size.

For the early part of the season give eleven eggs.

If possible set two hens at the same time. On the sixth or seventh day test the eggs, remove the unfertile ones and give the remainder to one hen, resetting the other.

The nests should be made of cut straw and put in a place separate from the other birds. While making the nests, each one should be dusted with insect destroying powder.

China eggs should be placed in the nest and the sitter allowed to remain on them for two or three days. The valuable eggs may then be given to her.

During the hatching period, nest and hen should occasionally be dusted with disinfecting powder.

Sitters and eggs should be examined every morning to see that all is right.

Should an egg be broken in the nest the others ought to be at once taken out, gently washed in luke warm water and replaced under the sitter. If the straw in the nest is soiled it should be replaced by clean stuff.

#### HOW TO PROPERLY FEED AND CARE FOR THE YOUNG CHICKS.

As I have also had much inquiry as to how to care for and feed the young chicks, the following information may be useful:—

After hatching out, the chickens should remain undisturbed in the nest for 24 hours.

Their first feed should be stale bread soaked in milk and squeezed dry, and stale bread crumbs. This may be continued for a day or two, when granulated oatmeal may be added.

Weather permitting, the hen and brood should be placed in a dry coop on the grass.

If kept indoors, the chicks must be kept on earth or on boards covered with earth. If not so kept, disaster will follow.

After being kept on the bread and milk and granulated oatmeal diet for a week, small particles of cracked corn may be added. At the end of two weeks whole wheat may be fed, but not before.

Care should be taken that the chicks are in no way stunted during the first five weeks of their existence. They should be pushed at all times, but require particular attention during the period named.

Young stock require frequent but light feeding. It must be remembered that a stunted chicken will never make a good market fowl.

The earlier hatched, the sooner will the pullets lay.

The aim should be to have the pullets laying while the hens are moulting. A supply of new laid eggs all the year round will so be secured.

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## OBJECT LESSONS IN KILLING, DRAWING AND DRESSING POULTRY.

At this point you will perhaps permit me to refer to a new feature of my work which was most successfully inaugurated at the Provincial Fat Stock Show of Ontario, held at London, Ontario, from December 9 to 15 last, viz., the killing, plucking, drawing and dressing of poultry in the presence of the audience. The fowls were dressed in two ways, first as the English farmer does when he sells on the market, and then as the English poulterer dresses, draws and trusses his poultry ready for the oven. I had the pleasure of delivering addresses from time to time during the show, and my wife did the dressing of the poultry. It was a very interesting and important occasion, for all the Farmers' Institute workers of the province were present in the pavillion when the object lessons took place and they evinced much interest in the demonstrations, which I hope were beneficial. This new feature of work was very much appreciated by the farmers and their wives who were present. Letters from farmers in different parts of the province of Ontario to the agricultural papers since the show have expressed the hope that such work will be done in schoolhouses or other points near their localities so that their wives and daughters might profit by the practical demonstrations. All being well another year, I may be able to have birds dressed in the different methods and brought before your Committee.

The following from an agricultural paper will show how the demonstrations were regarded:—'At the London Stock Show one of the most interesting features was the object lesson given in the killing, plucking, drawing and dressing poultry by Mrs. Gilbert, wife of the poultry manager of the Dominion Experimental Farm. Several of those present expressed the opinion that it would be well if similar lessons could be given in country villages, at school-houses or at such points as could be easily reached by farmers, in the different neighbourhoods. It was pointed out that the people who would profit most by instructions of this kind seldom go to cities, but they are anxious for the information, and the opinion was freely expressed that the provincial or Dominion government should endeavour to give the information in the way stated. It was also suggested that lectures in this connection might go further and include talks dealing with the merits of the different breeds and showing which are best adapted for winter layers and which for the production of chickens for market.

'This is a capital idea. The lectures might be made a new and attractive feature of Farmers' Institute meetings. By making something of this kind a part of the programme at institute meetings the object aimed at would probably be most fully attained.'

## DISCOVERY OF A FATAL DISEASE AMONG TURKEYS.

I have brought certain features of the most important work I have done last year pretty fully to your notice, but there is one more subject I would like to bring to your attention before I close, and it is the discovery of a disease among turkeys which has been hitherto unknown but prevalent and fatal in different parts of the Dominion and the source of much loss to the farmers.

The symptoms of the disease are fairly described in the following letter which I got from Mr. John McCarthy, farmer, of Oldcastle, Ont., who sent on the description of the disease at the instigation of Mr. McGregor, M. P. Mr. McCarthy writes:

'OLDCASTLE, September 18, 1899.

'DEAR SIR,—We received yours of the seventh. We have had the cholera among our turkeys for the last ten years. It comes on in any season of the year. We live on a farm and they have the run of the farm. In summer we close up the hen house, and the turkeys roost on the top of buildings. We then clean out the poultry house and sprinkle the roosts with coal oil before we let the turkeys into it again.

'In the spring when the ground is wet *they drink water out of the barn-yard*, but in the summer we carry the water to them and it is clean.

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'They are fed on oats, corn and meal, but since we got the letter from you we soaked their feed in coal oil, but they will not eat it. We do not keep all the fowl in one place. We have a shed to put them in. All the chickens, turkeys, ducks and geese go together. There was a turkey died the other day from the disease.

'When they get the disease they get droopy and a black head, there is yellow discharge in the droppings like sulphur. This is about as close a description as I can give of the disease.

'Yours very truly,

'JOHN McCARTHY.'

The above letter will serve as a sample of many received by me. But what led to the discovery, or locating of the disease, was the enclosure to me of the following letter from the Editor of *Farming*, Toronto, who had received it from the 'Farmer's Daughter.'

'To the Editor of *Farming*.

'Will you inquire for me through your paper how to treat sick turkeys. My turkeys are drooping away. Their droppings are of a green and yellow colour at the time of their sickness, and they don't last long when they take sick.

'FARMER'S DAUGHTER.'

To this I sent the following reply: 'The symptoms point to liver disease or acute dysentery caused by eating improper substances, mayhap in shape of decayed animal or vegetable matter. Try a good condition powder and use as directed. Drop a small piece of alum in the drink water. There are too many turkeys dying of similar symptoms in different parts of the country, and thorough investigation into cause, disease and treatment (if any) should be at once made. Send a turkey that has just died to the Bacteriologist, Ontario Agricultural College, Guelph, to ascertain whether death is due to germ disease or not. At same time give full particulars of how the turkeys are housed, on what fed, and what they drink. Give all symptoms of the disease. Do the birds drink filthy water, barn-yard leakage, &c.? Let your correspondent, for her own good and that of others, take action in this matter.'

The farmer's daughter, to her credit be it said, complied with my suggestion. Some time afterwards I received the following letter from Mr. Malcolm Ross, who was in charge of the bacteriological laboratory, at the Ontario Agricultural College, Guelph, during the temporary absence of Mr. Harrison in the old country.

'ONTARIO AGRICULTURAL COLLEGE,

'GUELPH, November 23, 1900.

'DEAR MR. GILBERT,—I have to-day examined a turkey from some one in Fergus who does not give any name. It is a case of *entero-hepatitis*, described in a Washington bulletin entitled "infectious diseases of poultry." This is, so far as I know, a new disease in Canada. The only account of similar cases being in the bulletin already mentioned. I believe it has also broken out at another farm in the neighbourhood, because I am told that there are turkeys dying there with spots on their livers. It is very good of you to have given me the opportunity of examining the disease. I may say that my rounp investigations are going on, and that I believe rounp is caused by a somewhat similar organism as the turkey disease. I shall always be pleased to examine birds.

'Yours sincerely,

'MALCOLM ROSS.'

I trust that the locating of this disease will result in good to the farmers.



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*By Mr. Sproule :*

Q. Will you give us the name of the disease again ?

A. *Enterio-hepatitis*.

Q. That would indicate inflammation of the bowels as well as the liver ?

A. They are certainly some of the symptoms.

A description of the disease is fully given in the Washington bulletin by Dr. Salmon, and is too lengthy to permit of my reading it to you. I may say, however, that the disease, its cause and treatment is fully dealt with in my annual report soon to be published. Briefly stated the remedy suggested is the thorough disinfection of the premises where sick birds have been, the removal of newly hatched birds to new ground and care in feeding them clean and wholesome food and pure drink water.

In referring to the subject, *Farming*, of December 11 last, says, in relation to the subject:—

‘In *Farming* for November 14, in our questions and answers department, appeared a letter from a farmer's daughter describing some sick turkeys and asking for a remedy. We submitted her letter to Mr. Gilbert, poultry manager, Central Experimental Farm, Ottawa, who, in his reply, which was published with the enquiry, advised sending a turkey that had just died to the bacteriological laboratory, Ontario Agricultural College. This advice was acted upon and in last week's *Farming* appeared the report of Malcolm Ross, in charge of the bacteriological laboratory at the college during the absence of Prof. Harrison in Europe. His report shows that the turkey died of *entero-hepatitis*, entirely new in Canada, and one for which no effective cure is known. In describing this disease, Mr. Ross says: “The organism causing it gains access to the bird in the early summer and will live in it for months; large numbers of them are excreted in the droppings. The only way in which the disease can be got rid of is by getting rid of all the turkeys, and not keeping any on the same ground for some length of time, at any rate, not till the next summer.”

‘The fact that such a disease is known to exist in the country makes it possible for effective measures to be taken at once to eradicate it and prevent its spreading to other districts. The symptoms given by Mr. Ross also make it possible for the disease to be located in other sections than the one in which the farmer's daughter lives. . . . This disease then may be prevalent in many cases, and we would advise those having sick turkeys showing the symptoms described to lose no time in making the fact known, and if there is any doubt to send some of the dead turkeys to Guelph for examination.’

*By Mr. Rutherford :*

Q. How is the disease caused; is it specific, contagious or infectious ?

A. Dr. Salmon, in his ‘Diseases of Poultry,’ calls it infectious *entero-hepatitis* of turkeys, or blackhead. He says:

‘For ten years or more reports from certain sections of the New England States have indicated the existence of a serious disease of turkeys, locally called “black-head,” which differs in important respects from any malady previously known as affecting poultry. How widely this disease is distributed over the world is not yet determined, but information from the Middle, Western and Southern States points to its prevalence in those sections, and accounts have also come to hand of its ravages in Europe. From these facts it may be concluded that the disease is one which has been affecting turkeys for many years and has been extensively disseminated, and that, owing to the lack of systematic investigation, it was not described until its study was undertaken by the United States Bureau of Animal Industry. Considerable time was devoted to this subject by Smith in 1893 and 1894, and Moore in 1895 and 1896.’

Q. What are the symptoms ?

A. Dr. Salmon describes the symptoms as follows:—

'The symptoms of infectious *entero-hepatitis* have not been very carefully observed and recorded. It is not until the disease has made considerable progress that any signs of ill-health can be detected. The affected birds show more or less loss of appetite, weakness and emaciation, though one or more of these symptoms may not be constant. Diarrhœa is the most marked and constant symptom and may be expected sooner or later in the course of the disease. It results from the inflammation in the caeca, which is the starting point of the affection, and this inflammation exists in all cases. Peculiar discolourations of the head occur at the height of the disease, which has led to the popular designation of blackhead.

The disease attacks quite young turkeys, having been recognized in a bird only three weeks old, and in this it had already made considerable progress. The young birds seem to be most susceptible, and as in the older birds the organs have the appearance of long standing disease, the conclusion has been reached that the infection usually occurs at an early period of life. The infection is most actively propagated during midsummer, but whether this is due to the fact that there are more young birds at that time or whether the warm season favours the dissemination and the development of the disease is not clear. That infection may occur in older birds and in cold weather is demonstrated by Moore's experiments, in which turkeys five months old and weighing 6 to 8 pounds were exposed in November and December, and in which the disease was well developed by the latter part of December and the early part of January.

'The disease begins in the caeca; sometimes it is found in but one of these organs, but oftener it effects both.

'Associated with this disease of the caeca, there is in nearly all cases a more or less serious disease of the liver. This organ is enlarged in proportion to the amount of its tissue which is affected. It may be twice the normal size, and over its surface are seen roundish discoloured spots, varying from  $\frac{1}{8}$  to  $\frac{3}{8}$  of an inch in diameter. Some of these spots are sharply defined circular areas of a lemon yellow or an ochre yellow colour. This yellow substance represents dead tissue. In other cases the spots are whitish, and shade off somewhat gradually into the surrounding tissue. Another class of spots are of a mottled brownish colour, darker than the surrounding liver tissue. These may have a central yellow nucleus of dead tissue, and a narrow outer border of the same character, or the border may be a dark brownish circular line. The entire spot has an indistinct appearance and is flattened or even slightly depressed below the surface. The liver may have few or many of these centres of disease, which, when cut across, are found to be deeply embedded in the tissue of the organ and to have in general a spherical form. Occasionally the lesions are very extensive and the death of large portions of the liver tissue follows.'

#### CAUSE OF THE DISEASE.

By Mr. Burnett:

Q. What is the cause of the disease?

A. Dr. Salmon says: 'The disease is caused by one of the protozoa, which Smith has named the *amoeba meleagridis*. This parasite is taken into the digestive organs with the food or drink, it attacks the mucous membrane of the caeca, causing the development of inflammation and leading to the changes already described.'

'The changes in the liver are most easily explained by assuming that the micro-parasites are conveyed by the blood directly from the diseased caeca into the liver and there deposited in different places. In this organ they begin to multiply and spread in all directions, thereby forming the spherical centres of disease which appear as circles on the surface of the liver. This theory is borne out by the results of the microscopic examination.'



## APPENDIX No. 1

## PROGRESS OF THE DISEASE.

'The course of the disease is variable. In some cases it develops rapidly after infection, and the affected bird dies in from two to six weeks. In other cases the morbid process may come to a stand still, but the amount of dead tissue in the caeca and liver may be so great as to favour the entrance of bacteria, which are directly responsible for the death of the bird late in the summer or fall. In still other cases regenerative processes may begin and lead to complete and permanent recovery. During the course of the affection parasitic protozoa multiply in the caeca, they are mixed with the intestinal contents, and many of them are discharged with the excrement. In this way the contagion is spread. The food and drinking water become contaminated with particles of excrement containing the parasites, the latter are taken by healthy birds into the digestive canal, along which they proceed until the caeca are reached, and here they multiply, penetrate the mucous membrane and set up the changes which constitute the disease.'

By *Mr. Rutherford*:

Q. So that it is a specific disease; it attacks only turkeys?

A. Yes, sir, so far, and it has doubtless been the cause of a loss of hundreds of thousands of dollars to the farmers of the country.

Q. Other fowl are immune?

A. Yes, so far as known.

## TREATMENT OF THE DISEASE.

Q. What treatment do you recommend?

A. I cannot do better than answer in the words of Dr. Salmon, who speaks as follows in regard to the treatment of the disease:—

'It is evident that the treatment of infectious *entero-hepatitis* must be principally of a hygienic and preventive nature. Where the disease has existed long upon a farm the roosting places, runs and feeding grounds must be infected. The breeding stock are affected in a chronic form and are continually disseminating the contagion. This being the case adequate measures must be adopted to free the premises from the parasite before healthy stock can be raised. Thorough disinfection should, of course, be carried out, using a solution of carbolic acid, five parts to one hundred parts of water. All of the turkeys on the farm should be killed in order to certainly get rid of the infected ones. In starting a new flock obtain eggs from healthy stock and hatch them under common fowls or in an incubator. Raise the young turkeys if possible on a part of the farm that has not been infected. By following this course it should be possible to eradicate the disease and obtain a healthy flock. The medical treatment of diseased turkeys has not been successful and it is doubtful if it could be profitably undertaken in any but exceptional cases.

## REMEDIES.

'Among the remedies most likely to be beneficial are sulphur, sulphate of iron, quinine, salicylic acid, benzonaphthol and betol. Where a flock has recently been infected it would be well to try these remedies with a view of arresting the disease in the mildly affected birds, and of preventing the infection of others by making the intestinal contents unsuitable for the multiplication of the parasite. Sulphur 5 to 10 grains, sulphate of iron 1 grain, may be combined and given at one dose. Or give benzonaphthol 1 grain, salicylate of bismuth 1 grain. Or give sulphur 10 grains, sulphate of iron 1 grain, sulphate of quinine 1 grain, hyposulphite of sodium may be useful in doses of 2 to 4 grains, or betol in the dose of 1 grain. It is necessary that such medicines should be repeated two or three times a day and continued for a considerable time to obtain results. The doses mentioned are for birds weighing 4 or 5 pounds.'

It is well to bring the foregoing statement to the notice of the country through your committee, and I hope they will be useful.



COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
WEDNESDAY, April 4, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 a.m., Mr. McMillan, chairman, presiding.

Mr. A. G. Gilbert was recalled and submitted the following:—

RECIPE FOR PRESERVING EGGS.

MR. CHAIRMAN AND GENTLEMEN OF THE COMMITTEE,—I am before you this morning to supplement my evidence of last Thursday by a very few remarks on the respective merits of two egg-preserving fluids. The experiment was conducted by Prof. Shutt, who was kind enough to associate me with himself in the experiment. A report was written out and I shall give you, without going into details, the results of the experiment in a few words. The investigation was commenced in September, 1896, and lasted for six months. It consisted in immersing the eggs for varying lengths of time—from a few hours to six months—in—

(a) Lime water, and

(b) A ten per cent solution of 'water glass.'

Perfectly fresh eggs from the farm poultry-houses were used for the test. Those eggs which were treated for a few hours, days or weeks, as the case might be, were subsequently placed, together with the untreated eggs to be used as a check, in a rack within a drawer in the laboratory till the close of the experiment on March 30, 1899. All the eggs were at a temperature of from 65 degrees to 72 degrees F. throughout the trial. The investigation was really to ascertain the respective merits of water glass (silicate of soda) and lime water as egg-preserving liquids. I may remark that perfectly fresh eggs from the poultry department were used and in all cases we found that, for all practical purposes, lime water was the best preservative of the two. Mr. Shutt's exact words are 'since water glass (silicate of soda) is more costly and more disagreeable to use than lime water, I could not, from the present results, recommend the former as the best preservative.' My principal reason for bringing the subject before the committee this morning, is to seize the opportunity of sending out to the country Prof. Shutt's recipe for making the lime water liquid, which was so successful in this case and for which preparation we frequently have applications. The recipe is as follows:—Three or four pounds of good fresh lime in five gallons of water, stirring well at intervals for a few hours and then allowed to settle. The clear water may then be poured over the eggs, which have been previously placed in a crock or water-tight barrel. Mr. Shutt thinks the 'addition of a pound or so of salt, which is sometimes recommended, unnecessary; indeed, it might lead to the imparting of a limy flavour to the egg by inducing an interchange of the fluids within and without the egg.'

The experiment shows the following two points to be all important, namely:—

1. That perfectly fresh eggs are put in the liquid, and

2. That they shall be covered with the preservative fluid, so as to prevent evaporation and consequent shrinkage of the meat.

There was one further point I should like to remark on.

*By Sir Henry Joly de Lotbinière:*

Q. How many gallons of water?

A. Five, but an increase or decrease in the quantity may be made.

## APPENDIX No. 1

Q. The eggs must be covered?

A. Yes they must be covered. There was a question brought up when I was before the committee on Thursday last as to hens which were laying suddenly ceasing to do so, and it was remarked as extraordinary that a hen apparently full of eggs should stop laying and remain a non-layer for some time. Dr. Rutherford brought up the interesting point. In reference to this subject I may state that Mr. H. W. Collingwood, the managing editor of the *Rural New Yorker*, under date of May 15, 1899, wrote to me in reference to a matter somewhat similar: 'will you be kind enough to give us your opinion regarding the inclosed note taken from the coming issue of the *Rural New Yorker*. I would like to know what physiologists think about this statement regarding the hen's egg. A good many wild statements are made from time to time regarding this matter and we would like to know therefore just what the facts are in the case.'

On this subject I would like to read an article which appeared in the *Canadian Poultry Review*, of which I was the author, and which contains the inclosure referred to by Mr. Collingwood. The article is as follows: 'Some time ago Mr. Collingwood, the managing editor of the *Rural New Yorker*, sent me an article by Mr. O. W. Mapes in which the following statement occurred:—

'Can any one tell us at what stage of development the egg is fertilized? Is it before or after the white begins to form? It would seem that after it is fertilized, it would be necessary for the egg to be finished and laid, on the same principal that a pregnant animal must give birth to her young. I am satisfied that no hen ever yet laid an egg until a group of eggs from the ovaries have been partially developed. I am also satisfied that this following group of partially developed eggs is re-absorbed in the circulation when the hen quits laying.'

Mr. Mapes goes on to describe a hen that was laying regularly. She was given nothing but water for ten days. She laid only one egg. She lost one pound in weight, and contained no egg larger than a pea when killed.

I sent the article to Prof. Wesley Mills, of McGill University, of Montreal, with a request for his opinion on the subject. With his usual kindness, Dr. Mills complied with my request and sent me the following, which I forwarded to Mr. Collingwood. It is well known that Dr. Mills is one of the leading physiologists in America and his opinion is therefore of much value. He says:—

'I venture to express the following views:—

The eggs are formed in the ovary, and are always at different stages of development, only one being ripe at the same time, as a rule.

2. The egg is fertilized either in the ovary or at the upper part of the oviduct or egg tube.

3. The latter is, especially in its lower part, a gland and secretes the various parts of the egg outside the yoke.

4. The conclusion that the eggs of the hen referred to by Mr. Mapes were absorbed, does not seem to me to be a necessary one, and inasmuch as, in a non-laying hen there is always a multitude of small, imperfectly-developed eggs in the ovary, renders it probable that not atrophy or absorption but incomplete development is the condition Mr. Mapes found. Nevertheless, I would not assert that absorption is impossible.

5. It is rare that one egg enters the lower part of the oviduct before the other already there is expelled, but such cases do occur, and explain the phenomena of double-yolked and other peculiar eggs. This latter subject is treated in an interesting way in a recent number of the *American Naturalist*."

Q. I am afraid I am going to show my ignorance by asking a question, but the other day I was talking with a friend of mine who has had a good deal of experience in this matter and he said it was easy to discover when an egg had ceased to be fresh and when it had reached a certain point of maturity which made it unfit for food by shaking it, because he said that when the germ inside the egg ceased to live it becomes absorbed in that part of the matter that is contained in the egg for its food and therefore leaves a vacuum which can be discovered by an experienced person. Of course I have not the slightest idea myself, I never tried it, but if there

is anything in it you may have heard something about it and be able to tell us. But really his theory that the absorption by the germ would necessarily leave a vacuum in the egg and by shaking it in a peculiar way you might discover whether the egg is past the time when it is fit for food, seems reasonable.

A. Yes, sir, the shaking is frequently done, especially in the case of eggs that have been under hens and do not hatch out when others do. At the end of the 21st or 22nd days when a few chickens only have been hatched out and it is thought a larger number of chickens should have been had, the unhatched eggs are taken up and shaken and a rattling of the fluid inside can be distinctly heard. But in regard to the distinction of fresh from stale eggs, there is a difference in the appearance of the shell. In an old egg the shell is glossy and smooth. The shell of the new-laid egg is chalk-like and the pores are much larger.

THE CHAIRMEN.—If it is not out of place I will just make a statement. There is a gentleman in Ontario who has just patented a system of preserving eggs. During last fall he took eggs out of a vat in which he had them in pickle since March to October. He took them out of the pickle and washed them. He then took three or four fresh laid eggs with them into the office of a doctor, who is a fowl fancier, and the doctor could not distinguish between the fresh laid eggs and the others that had been in the pickle and washed.

*By Mr. Featherston :*

Q. From the outer appearance ?

MR. McMILLAN.—He could not distinguish them. I will just say that the eggs preserved by his recipe will boil perfectly and that is something that eggs that are in pickle will not do. All that I know about his method is that there is lime and salt in the pickle but it is a patent. He puts his eggs upon the British market in the very best condition possible.

MR. F. T. SHUTT, Chemist of the Experimental Farms. Having had a good deal to do with these experiments, the results of which Mr. Gilbert has brought before you, I might say a few words on the subject of egg preservation. There are a large number of recipes appearing in the press from time to time, some of the ingredients of which I do not think of any value as egg preservatives. The main ingredient in all of them is lime, if we leave out of consideration for the moment the newly recommended material, silicate of soda. We found that the addition of a large quantity of salt to the lime acted injuriously as regards the quality or flavour of the egg. When we examined the whites of the eggs so preserved after a few months, we found they contained a large amount of salt, showing there had been an absorption of salt from the preservative fluid by the egg. As regards the appearance of the eggs, those kept in the lime water are equally good, indeed I think better than those in the lime water to which salt had been added. The eggs were kept for fourteen months in this solution (lime water); and I think it would have been impossible for an expert to have distinguished them from newly laid eggs. Also, when they were broken the appearance was excellent, that is to say, that the yolk retained its rotundity; the difference was apparent when they were cooked. We poached them in order to test them—and in this way all these eggs were tested—in every case there was a slight flavour developed as compared with fresh eggs. So that though they might have an excellent appearance both inside and outside, our experiments showed that we could not keep them without this slight and peculiar flavour developing. They could always be distinguished by the taste from new laid eggs.

*By Mr. Featherston :*

Q. At what temperature did you keep them ?

A. At the temperature of the laboratory—about 65° to 70° F. Those that were kept in fluids were put away in bottles in the laboratory, and those which were only treated a certain time in the fluids were subsequently placed in drawers.



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Q. In an ordinary room?

A. Yes; just like this.

*By Mr. Moore:*

Q. Would the difference in the flavour be when the eggs were boiled or poached?

A. We had them treated the same and poached them all.

*By the Chairman:*

Q. You did not test whether they would boil or not?

A. Yes; we did that to see whether the shells would crack, and in a good many cases they did. A good deal depended on the care with which they were boiled, but in many cases the eggs cracked.

THE CHAIRMAN.—I may say that the man I mentioned put them in boxes 8 to 10 feet long, 3 feet wide and 4 feet deep, and filled them with eggs nearly up to the top.

MR. HENDERSON.—I may state that I have had a little experience in the preserving of eggs, and probably know the gentleman to whom you refer.

THE CHAIRMAN.—Yes; I know him well.

MR. HENDERSON.—My whole idea is that if you can keep eggs for twelve months in perfectly cold water, it is the best preservative. I don't think we can do that, for you must put something in the water to maintain its sweetness and these are the ingredients which rather tend to injure the eggs. Lime destroys the boiling qualities, because it eats into the shell and when boiled the shell cracks. Now, I am not going to tell here what this gentleman's secret is or what his patent is, but there is one ingredient used after the eggs are put in which forms a crust and absolutely prevents the air getting in. It is gum arabic. That does not preserve the egg, but it serves to close up the pores and keep the air out. Lime is not a preservative, but it serves to keep the water sweet. If you could keep the water fresh for twelve months you would have perfectly fresh eggs. Twelve or fifteen years ago I had some eggs which were kept for twelve months and which I showed to a New York dealer, and he was absolutely astonished at the perfect appearance and perfection of the egg and yolk.

MR. FEATHERSTON.—What were they in?

MR. HENDERSON.—In a pickle such as the chairman speaks of. Lime, which is one portion of the pickle, is of no use as a preservative; it is simply used to keep the water sweet. If you could keep the water sweet without these ingredients you would keep the eggs wholesome. There is no question that eggs can be kept and kept well, but I always understood we could not keep eggs twelve months without lime in the water and lime weakens the shell and it cracks.

MR. COCHRANE.—What do you want to keep eggs twelve months for.

MR. HENDERSON.—To get better prices.

MR. COCHRANE.—Would it not be better to have the new laid article all the time if possible?

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Having read over the preceding transcript of my evidence of March 29, and April 4, I find it correct.

A. G. GILBERT.

*Manager Poultry Branch, Central Experimental Farm.*



## SOILS, FERTILIZERS AND FARM PRODUCTS.

COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
OTTAWA, Wednesday, April 4, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock a.m., Mr. McMillan, Chairman, presiding.

Mr. F. T. Shutt, M.A., Chemist of the Dominion Experimental Farms, was called and made the following statement:—

MR. CHAIRMAN AND GENTLEMEN,—The work of the chemical division of the experimental farms has, I am pleased to report, progressed satisfactorily during the past year. This statement does not imply that we have been able to do all that has been asked of us by farmers in the matter of analysis—for that would be quite impossible—but it does mean that comparatively speaking a large amount of chemical work has been accomplished in connection with our investigations, and that as far as was practicable and advisable examination has been made of soils, fertilizers, food stuffs, water, &c., forwarded us for analysis. We have every reason to consider that the results obtained from both these classes of work will be found of practical value to Canadian agriculture. In addition to chemical work we have, as in past years, afforded assistance through correspondence and lectures—the former a popular and ever-increasing branch of our work and the latter a most useful and important feature, since it brings us more or less into personal contact with the people actually engaged in farming, and frequently allows the study of soils and conditions generally of a district not otherwise easily obtained.

In addition to this work we have, as for several years past, prepared and distributed the tuberculin used by the Dominion veterinary surgeons. From November, 1898, to November, 1899, a quantity sufficient to test 17,169 cattle has been put up and forwarded from our laboratories by direction of the Department of Agriculture.

*By the Chairman :*

Q. That is for the tuberculin test?

A. Yes, for tuberculosis.

In August last we moved into the new chemical laboratories erected at the farm to replace those damaged by fire three years ago and which have, since our removal, been converted into office accommodation for other members of the staff. The laboratories now occupy a separate building, specially constructed for the purpose, and finished interiorly with pressed brick in order to make it practically fire-proof from within. While not in any sense elaborate, the new laboratories are distinctly in advance of their predecessors, and the increased office and store room afforded by the building will very much facilitate our chemical work. The various investigations that have engaged our attention fall into certain fairly well defined groups or classes, of which the following are the chief:—

1. The examination of virgin and cultivated soils.
2. The determination of the plant food in naturally-occurring fertilizers
3. The analysis of fodders and food stuffs with the view of ascertaining their feeding value.



4. The examination of well waters from farm homesteads and dairies.

5. The prosecution of original research in connection with questions relating to plant and animal production, soil improvement, the chemistry of spraying mixtures, &c., &c.

This latter subdivision naturally includes some of our most important work.

As it will be quite impossible to pass in review all the results obtained during the past year, I shall content myself with placing before you briefly those which may be considered of greatest value. In this retrospect it may be well to follow the order just given.

#### SOILS.

Owing to pressing and urgent demands in other branches of our chemical work, we have not been able to devote the attention to the examination of soils that has been our custom in previous years. Consequently, our data on this subject are not voluminous. There is, however, one series of results that I shall draw your attention to, since the data obtained not only serve to demonstrate a scientific truth, but also to teach a very important lesson in the maintenance of soil fertility.

We received from Kent County, N.B., two soils, the one a virgin soil, never cropped or manured, the other a cultivated soil which had been cropped for a number of years with but little, if any, return of plant food. These samples were collected from spots so close to one another as to leave no doubt but that the cultivated soil had been originally identical, or practically so, with the virgin soil. Judging from appearance, there was but little difference between them; both were grayish-red loams, in which sand predominated. They were underlaid by a subsoil of heavy clay. The determination of their plant food constituents, however, revealed well marked differences. The more important data are as follows:—

Organic matter, that is to say, vegetable matter in the virgin soil, 8·04 per cent; cultivated soil, 5·49 per cent; nitrogen, an essential of plant growth and an element also closely associated with the organic matter of humus, virgin soil, ·158 per cent; cultivated soil, ·113 per cent; phosphoric acid, virgin soil, ·24 per cent; cultivated soil, ·12 per cent; that is just one-half. Potash in the virgin soil, ·51 per cent; in the cultivated soil, ·30 per cent; about two-thirds, lime an important element also, virgin soil, 89 per cent; cultivated soil, ·02 per cent, practically traces only.

The following table presents these data in a form which admits of their ready comparison:—

	Virgin Soil.	Cultivated Soil.
Organic matter. . . . .	8·04	5·49
Nitrogen. . . . .	·158	·113
Phosphoric acid. . . . .	·24	·12
Potash. . . . .	·51	·35
Lime. . . . .	·89	·02

In all the essential constituents of plant food—nitrogen, potash and phosphoric acid—the cultivated soil is seen to contain percentages much smaller than those in the virgin soil.

If we are right in assuming, as I think we are, that this cultivated soil was at the outset similar, or practically so, in composition to the virgin soil, we have in these data an excellent illustration of the depletion that necessarily follows an improper and foolish system of farming. They also furnish a striking evidence of the value, in certain cases at least where comparison can be made, of the value of the chemical examination of soils.

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Considering these figures somewhat more in detail, we observe that the organic matter, that is to say, the humus, has been considerably reduced by cultivation, namely, from 8.04 per cent to 5.49 per cent. The important functions of this soil constituent have been emphasised on former occasions, and therefore it may not be necessary to dwell on this subject at length to-day. I shall only point out that in these results we have convincing proof of the inevitable destruction of this organic matter, due to tillage operations and of the necessity in using some fertilizer such as barn-yard manure or a crop of clover or buckwheat turned under to keep up the proportion of this organic matter in the soil. There is no doubt that the adoption of a rotation in which clover occurs every fourth or fifth year would be most helpful in maintaining a due proportion of humus. Continuous grain growing or continuous root growing tends to diminish the amount of this constituent. The point is, that the necessary operations of farming, ploughing, harrowing, &c., bring about conditions that tend to dissipate and destroy the organic matter of the soil, and thus we are constantly losing a very important constituent, one that regulates the moisture in the soil and the temperature of the soil and brings about that right mechanical or physical condition that makes a soil suitable for crop growth. We therefore are justified in saying that both from a chemical and physical standpoint, it is necessary to add to the soil some form of organic manure.

You will notice also that as the organic matter declines so does the nitrogen diminish.

*By Mr. Bell (Pictou):*

Q. In what form to you find that nitrogen?

A. I refer to organic nitrogen, that is, combined with the humus.

Q. It would not disappear in your process of analysis from the humus?

A. Our process of analysis will show all the nitrogen in the soil. It is the nitrogen contained in the organic matter or humus that is slowly dissipated by ploughing, harrowing, &c., by continuously presenting fresh surfaces to the air. This dissipation of the organic matter and nitrogen may also be largely due to microbic life, the activity of which is hastened by disturbing the soil.

The fact made clear by the figures I have brought before you bears out the statement that I have frequently made, that humus is the natural storehouse of nitrogen and that the proportion of the former is in a large degree a measure of the latter. Since nitrogen is a very expensive form of plant food, it becomes a problem of importance to ascertain the best plan to preserve it in the soil and the cheapest way in which it may be returned.

*By Mr. Featherston:*

Q. You say it disappears from the constant working of the soil?

A. It frequently happens that there is really more loss from this cause than from the amount removed in the crop.

Q. From cultivation?

A. From cultivation and from leaching. No doubt the reduction of the nitrogen in the cultivated soil that we are considering has been largely brought about by its removal in crops, but nevertheless I feel assured a large proportion of it has been lost as I have just intimated. For example, experiments in Minnesota showed that for every 20 pounds of nitrogen consumed by the crop (grain following grain) considerably over 100 pounds was lost by tillage operations, partially due to the oxidation of the organic matter.

*By Mr. Bell (Addington):*

Q. By leaching?

A. Possibly so in part, but not altogether so. When we turn the soil and expose it to the air, we are producing conditions that lead to the combustion of the organic matter in that soil. We are exposing the particles of soil to the air, and the oxygen

either directly or through the agency of germ life combines with the organic matter, forming carbonic gas acid. This of course means the reduction of the humus or organic matter.

Q. That would not take the nitrogen ?

A. Yes, in a large measure the nitrogen is burnt up as it were, or at all events disappears with the organic matter.

*By Mr. Featherston :*

Q. That would throw out summer fallowing altogether ?

A. Not necessarily, though I think the practice might very well be discontinued in Eastern Canada, save where it is necessary to employ it for cleaning the land.

*By Mr. Bell (Pictou) :*

Q. Don't you think most of the loss of nitrogen is by leaching ?

A. I think some of it is, but not all. Much would depend upon the character of the soil and the nature of the season. It seems evident, however, that all the nitrogen lost has not been converted into nitrates.

Q. It must be in the form of ammonia ?

A. Not necessarily. It might go off in the form of free nitrogen gas. We found in the fermentation of the manure that a large part of the nitrogen lost was not in the form of ammonia but in the form of nitrogen gas. I see no reason why a part of the soil nitrogen may not be lost in the same way.

*By Mr. Featherston :*

Q. That is from a heating process ?

A. Practically it is a form of combustion brought about by germs or microbes which are microscopic plants. These in the presence of air and moisture consume as it were the organic matter of the soil. There are many different kinds of soil microbes and they differ greatly in their functions. Many of them do a very useful work in preparing the food for higher plants, which, as you know, include all our farm crops.

Now, turning once more to our table of data, you will observe that the mineral constituents in the cultivated soil have all suffered, indicating the necessity of their return if productiveness is to be regained. This soil would now need a heavy application of wood ashes or some mineral fertilizer containing potash, phosphoric acid and lime. Of wood ashes, 50 to 100 bushels per acre might be used, or, if these are not available a mixture of 100 pounds of muriate of potash and 250 pounds of superphosphate of lime may be applied. Then if possible a dressing of barn-yard manure should be given and clover sown. If the farmer has stock the most profitable plan would be to feed the clover and apply the manure to the soil. No better preparation of the soil for either grain, corn or roots can be made than by turning under a clover sod. The probability is that if a rotation containing clover had been followed such an exhaustion of mineral ingredients would not have taken place, for one useful purpose served by clover undoubtedly lies in the appropriation and preparation of mineral food ; that is to say, during the growth of the clover a large amount of mineral food is abstracted by its roots from the soil, and this by the decay of the clover is returned in a more or less available form for succeeding crops.

*By Mr. Bell :*

Q. That would not return the lime ?

A. If the clover were cut and fed and the manure not returned to the soil, undoubtedly there would be a loss to the soil of mineral constituents—the soil would be so much the poorer. But even in such a case as this, we must remember, the amounts of mineral constituents contained in the stubble and roots would be eventually added to the soil. If the aftermath or second growth were turned in there would be still more added to the soil. You are doubtless aware that the organic matter as well as



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the greater part of the nitrogen of the clover is derived from the atmosphere ; much of the mineral matter is obtained by the roots from the lower layers of the soil not reached by the roots of other crops. All these are added to the surface soil when the clover is ploughed under.

Q. Still there would be a constant loss ?

A. Yes, there would be of mineral matter, especially if the crop were sold off the farm.

Q. And eventually you would exhaust all the mineral matter ?

A. If it were desired to habitually sell off the clover hay, I would certainly counsel the application of mineral fertilizers, but if it were fed on the farm and the manure returned there would be very little loss of mineral ingredients to the soil.

Q. Ploughing it down ?

A. By ploughing it down you would be enriching the surface soil in mineral matter by what is brought up in the roots from the lower layers of the soil. That is what we understand by "green manuring." Its chief value, however, lies in enriching the soil in nitrogen and organic matter.

*By Mr. Featherston :*

Q. When it is turned down the organic matter is added to the soil and subsequently converted into humus, enriching the soil ?

A. Yes.

Since the question appears to be one of interest to you, it may be well for me to recapitulate what I have said regarding the importance of humus in maintaining and improving soil productiveness.

1. It is the natural storehouse and conservator of nitrogen, which is the most expensive of all plant foods when it becomes necessary to purchase it in commercial fertilizers.

2. It furnishes the food upon which the soil micro-organisms (microbes) live, and which, by their life functions, convert its organic nitrogen into nitrates and probably prepare mineral food for the nourishment of farm crops.

3. It contains considerable amounts of the mineral food constituents. These, in the further decay of the humus, a process continually going on in summer, are liberated in forms available to growing crops. We have reason to believe from recent research that the mineral humates furnish a large proportion of the potash, lime, &c., used by crops.

4. It serves to increase the absorptive and retentive powers of soils for moisture.

5. It regulates and protects against extremes of soil temperature.

6. It opens up and mellows heavy soils.

7. It serves to materially diminish the loss of fertilizing elements by drainage, thus permanently improving in the best way sandy and leachy soils.

Green manuring by clover, however, means something more than all this, for we know that it enriches the soil with nitrogen otherwise unattainable, that is, the nitrogen of the air. The legumes, of which clover is a prominent member, alone have the property of assimilating this free or uncombined nitrogen. This the clover does not do directly but through the aid of certain bacteria or germs that reside in the nodules or tubercles found in the roots and rootlets of the clover. A good crop of clover will furnish in this way more than 100 pounds of nitrogen per acre.

## A SOIL STUDY IN THE NORTH-WEST.

When in Portage la Prairie, Manitoba, one of the finest wheat districts of the North-west, a few weeks ago, I was told by several farmers that they were already beginning to notice a falling off in the yield of grain. The soil of that area is very rich and has only been tilled twenty-five years, yet it is more than probable, since no form of manuring is practiced, that this diminution in yield is due to the reduction in the amounts of the more soluble forms of plant food. This we intend to ascertain if possible during the coming year by the analysis of cropped and uncropped soils from

that district. From the mention of this instance it is not to be inferred that the district mentioned has suffered in any greater degree than any other cultivated area in the North-west. I only refer to it as one that has come under my notice and as one having a bearing upon the subject we are now considering—the exhaustion of land by continuous cropping and the necessity of returning plant food if productiveness is to be maintained.

*By Mr. Douglas:*

Q. I did not catch the name of the district?

A. It was the Portage la Prairie district, one which is a very excellent wheat area.

It will not be a matter of surprise if we find the cultivated soil to contain less humus and nitrogen than the adjoining virgin prairie, for it has been shown that the humus is dissipated by the necessary cultural operations and that the diminution of nitrogen due to the same cause is also considerable—several times, for instance, the amount utilized and removed by the wheat crop. As soon as the season opens samples will be procured of the virgin prairie soil and also of the soil from closely adjacent fields which have been tilled successively for twenty-five years by the growth of wheat without any restoration of the plant food. These samples will, as far as possible, be representative. We shall then submit them to analysis and I think we shall be able to notice differences in the amounts of plant food they contain. We purpose estimating both the 'total' and the 'immediately available' plant food in these soils, and expect the results will be exceedingly interesting.

*By the Chairman:*

Q. If you are going to try the soil from Portage la Prairie you should try the soil down deeper as well as at the surface as it is all black muck. My opinion is that it is as good underneath in that black soil as it on the surface?

A. I know it is a soil of great depth.

Q. So that you should get some soil from 18 inches down as well as the surface?

A. Yes. We purpose obtaining samples representing the soil (a) in the first 7 inches, and (b) in the second 7 inches, that is at a depth from 7 to 14 inches.

*By Mr. Douglas:*

Q. I notice also that in these old districts such as Portage la Prairie where wheat has been grown for so many years that the grain is becoming smaller in the kernel and it is not equal to that in the newer parts, and this principle is recognized in grading the grain?

*By Mr. Featherston:*

Q. Due to the top soil being exhausted?

Mr. DOUGLAS.—Yes.

Mr. SHUTT.—At our meeting in Portage la Prairie several, indeed I may say, many of the farmers present endorsed what had been said about the yield of wheat diminishing. They thought it would be necessary to grow clover to recover the soil's productiveness. I confess I was somewhat surprised to hear these remarks, for we have been given to understand that this soil was a sort of mine of plant food, inexhaustible, and one which it would never be necessary to manure. A very slight knowledge of agricultural chemistry, however, is all that is needed to assure us that, in spite of the great richness of these soils, the system of continuous grain cropping now in vogue in many parts of the North-west will have to be materially modified if the soil's productiveness is to be maintained. I have shown that there is necessarily a loss of nitrogen due to tillage and that the richer the soil the greater this loss. To this loss we may add that removed in the crop. The rate of soil exhaustion, due to the growing of wheat after wheat for twenty years, that is removed in twenty average crops of wheat, approximates 700 pounds nitrogen, 700 pounds potash and 400 pounds phosphoric acid. And these elements it should be remembered

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are derived from that small proportion of plant food that exists in the soil in a more or less immediately available form. Soil productiveness is measured by the proportion of assimilable plant food present—small though that proportion may be—rather than by the total amount present and which can only be very slowly converted into compounds or combinations usable by crops.

## A SOIL STUDY IN CAPE BRETON.

An exceedingly well marked instance of soil depletion came under my notice while in Cape Breton last summer. In a certain district in which I was travelling I found that it had been the custom practically to abandon the soil after five or ten years cropping, the farmers continually clearing up new land in order to obtain remunerative crops. I may add that very little stock had been kept, that the chief crops were hay, oats, and potatoes, and these for the most part were sold off the farm, no system of rotation or green manuring was followed, and that the soil—originally a light one—had suffered not only in the clearing by the destruction of organic matter (humus) by fire but was continually getting poorer and poorer in this constituent, so that acres upon acres now abandoned were growing up once more with spruce, and in time would become wild lands again.

*By Mr. Featherston :*

Q. Was that a sandy soil ?

A. Very sandy.

*By Mr. Sproule :*

Q. How deep was the soil ?

A. Not a very great depth, I should suppose from 5 to 6 inches—in some places less.

Q. Would not that land, if cultivated properly, last ?

A. Yes, I was going to point out that owing to a foolish and improper system being followed, the soil had now become reduced to a point at which it was no longer economical to till it. The men practically abandon the land after they have taken off five or six crops and go farther into the woods to clear more land. The first step was a wrong one. In clearing up the land by the use of fire, the humus and vegetable matter in the soil was destroyed and the nitrogen went with the humus, so that the initial store of these constituents was very materially reduced. Subsequently a system of farming was carried on which only made matters worse. The continual working over of the soil reduced its productiveness. Further, the crops, principally oats and potatoes, were sold off the farm, very little stock was kept, no rotation followed and practically no clover sown.

*By Mr. Featherston :*

Q. To what depth do you suppose the soil was burned ?

A. I can not say exactly. In Muskoka once I examined a soil that had been burned over and I found the fire had gone down four or five inches, and I dare say it might in light soils go still deeper.

*By Mr. Semple :*

Q. Do the farmers sow much rye in New Brunswick—that will grow in poor soil ?

A. No, I do not think they have been growing much rye. Soils such as I here refer to would not grow clover at first. It would be necessary first to grow rye or buckwheat and turn it under to enrich them to a certain extent, before clover would grow. The difficulty is to get a poor, light soil to hold enough moisture for



a crop. It is very poor in plant food but the worst feature is that it dries out so quickly, soils lacking in humus dry out very rapidly.

Q. If they had seeded it down with the first crop there would never have been such trouble?

A. True, I told them of the value of green manuring and that they should make an effort to introduce clover more extensively. When the soil was too poor to grow clover a crop of buckwheat or rye should be turned under and then trial made with clover, giving it some mineral fertilizer if possible.

Q. Are such lands as you have described reclaimable?

A. Many of them undoubtedly are, though for many years they would yield no profit. Our principal work, however, lies in advocating such changes in farming methods as will serve to *maintain the original productiveness of such soils, while still they are giving remunerative crops*. By keeping more stock, by looking carefully after the manure, by adopting a good system of rotation and the more extensive growth of clover, these light soils, I feel sure, might be maintained in fairly good condition. I consider that if you have failed to maintain the original fertility of a soil, it is going to be an exceedingly difficult and expensive affair to bring that land back into profitable working order.

#### NATURALLY-OCCURRING FERTILIZERS.

Under the term of naturally-occurring fertilizers, I include marls, mucks, muds and tidal deposits found in Canada, possessing a certain fertilizing character. Of these, I shall only mention in detail one important instance, that of the examination of a marsh mud from the Habitant River on the Bay of Fundy, Nova Scotia, analysed at the instance of Hon. F. W. Borden. In past years we have made many analyses of similar deposits, but have contented ourselves with a determination of the total plant food constituents present. Our work had disclosed the fact that the elements of fertility were only present in amounts practically equal to those in fairly good soils. It, therefore, occurred to me that the fact of their being held in such high estimation as fertilizers must be due to some feature that we had not yet discovered. I accordingly determined in this sample not only the mineral plant food extracted by strong acid solvents but also that proportion soluble in one per cent citric acid, and which we may, therefore, suppose was more or less immediately available for crop use. The results of this examination showed that a very much larger proportion did so exist in an assimilable condition than is to be found in ordinary soils. That is to say, that comparing the total plant food in this mud and ordinary soil we found no great differences. But, on following the work up and determining the proportion of that plant food immediately available there was found to be a larger proportion in the marsh mud than ordinarily found in soils. We have in this discovery an explanation—at all events in part—of the manurial value of these deposits. If we find from future work that this deduction is correct, we shall have gained valuable information on a subject of great importance to many farmers in the maritime provinces. I trust I have made it clear that these marsh muds are not to be considered as rich in plant food, that the quantity they possess is not large, but that a considerable proportion of that plant food is immediately available.

*By Mr Bell (Pictou):*

Q. What substances did the one per cent of citric acid liberate?

A. In the solution obtained by the citric acid, I estimated the phosphoric acid and potash.

Q. What percentage of phosphoric acid, do you remember, was immediately available?

A. Our estimation of total phosphoric acid showed .15 per cent, an amount which approximately is equal to that found in good soils, and of this phosphoric acid, .05 per cent, that is to say, one-third or thirty-three per cent of the total

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phosphoric acid, was immediately available. In good average fertile soils, we find not more than five or six per cent of the total phosphoric acid present, as a rule, is available. Then, in regard to potash, the amount present was .25 per cent, which is by no means a large quantity, even in soils of moderate fertility. Many soils contain two and three times that amount. The available potash was .06 per cent, which is equal to twenty-four per cent of the total potash present. In ordinary fertile soils we consider two per cent of the total potash or thereabouts—not two per cent of potash—is a very good average.

Q. There was 25 per cent of potash.

A. Yes, in this case.

*By Mr. Cochrane :*

Q. That was in muck?

A. No, this was in tidal deposit or marsh mud, from the Habitant River, Nova Scotia. In the following table I have compared a fairly rich soil from British Columbia with this marsh mud. The data are so arranged as to show at a glance the facts I have brought before you respecting the greater availability of the plant food in these deposits.

	Soil from British Columbia.	Marsh mud from Nova Scotia.
Potash. ....	.23	.25
Available potash.....	.005	.06
Percentage of the total potash available for plant use. ....	2.2	24.00
Phosphoric acid ....	.19	.15
Available phosphoric acid.....	.010	.05
Percentage of the total phosphoric acid available for plant use. ....	5.66	33.33

If an application equivalent to 100 tons of the air-dried material, per acre, were made, there would be furnished to that area, approximately 120 pounds available potash and 100 pounds available phosphoric acid.

## SWAMP MUCK.

A number of samples of swamp muck and peat from various districts in eastern Canada have been examined and reported on. Such materials can be used to advantage on farms where the soil stands in need of humus and nitrogen. Direct application of the crude raw muck, however, is of little value, if any, to the soil, owing to its slight acidity and the fact that its plant food is not available. We therefore recommend composting, or its use as an absorbent in and about the farm buildings, anywhere indeed where there is liquid manure going to waste. After being air-dried it is an excellent absorbent. By its use as an absorbent it serves a good purpose in retaining much valuable fertilizing material that would otherwise be lost. Subsequent fermentation in the manure heap liberates its plant food. The value of any sample of muck will depend largely on the degree of its decomposition and its freedom from clay and sand.

The samples analysed and reported on last year comprise five from Prince Edward Island, three from Nova Scotia, six from New Brunswick and six from Quebec. The nitrogen, in the air-dried material, ranged from .44 per cent to 2.63 per cent, and the organic matter from 13 per cent to 86 per cent. A good average sample, dried till it contained from 10 to 15 per cent moisture, will show from 1.5 per cent to 1.75 per cent nitrogen and 60 per cent to 75 per cent organic matter.

I may be allowed to add that owing to the attention we have called to this material there is a great deal of it now being used throughout Canada, particularly in the maritime provinces, and consequently the store of manure much increased both in quantity and quality thereby.

Other fertilizing materials that have been analysed during the year are ashes from a tannery, wood ashes, fish pomace, sludge and poudrette (products from sewage purification), and a number of other materials of similar character. In the tannery ashes we found approximately one-half the potash present in good wood ashes. They contain fair amounts of phosphoric acid and lime. If taken direct from the furnace they are worth practically half the price of wood ashes.

We may again call the attention of farmers in the neighbourhood of fishing villages to the great value as a fertilizer of fish waste. This material affords both nitrogen and phosphoric acid in notable amounts. Moreover, its plant food constituents, by fermentation, are readily set free in available forms. If composted with wood ashes and swamp muck it would make an excellent manure, rich in all the essentials of fertility and quick in its action. Much of this fish offal is now allowed to go to waste, frequently causing a nuisance and endangering the health of the neighbourhood.

#### FODDERS AND FEEDING STUFFS.

An important grass in the maritime provinces is broad-leaf. We have in past years made several analyses from the hay of this grass cut at various points. The data obtained appeared to show that specimens from the North-west were decidedly superior to those from Nova Scotia and New Brunswick.

*By Mr. Bell (Pictou):*

Q. What grass is that?

A. Broadleaf, the botanical name of which is *Spartina cynosuroides*.

I was led to believe, from our work on grasses, that this was largely due to the practice, in the maritime provinces, of cutting the grass so late in the season. We accordingly got another sample from New Brunswick, cut at an earlier date and submitted it to analysis. Our figures show a decided improvement in quality over that previously procured, but yet that it was not equal in nutritive qualities to either Timothy or Brome grass hay. As its digestibility, according to certain American authorities, is not equal to the hays of these latter named grasses, we would be justified in placing its food value at about 15 to 20 per cent less than Timothy or Brome grass hay. The point, however, is that our work has shown that the Broadleaf hay as grown in the Maritime Provinces would be very much more valuable, more nutritive, if cut earlier than is now customary.

Mr. FEATHERSTON.—Is Broadleaf hay the ordinary crop of hay there?

Mr. BELL (Pictou).—No; it grows on wet marsh lands and is not ripe as a rule till September.

Mr. SHUTT.—Marsh hay is the name it goes by there, though the term includes many other grasses that grow on the banks of streams and in marshes. The dyked lands grow an excellent quality of hay, consisting largely of Timothy.

The comparative value of hay from early and late cut Broadleaf is shown by the following data;—

#### ANALYSIS OF BROADLEAF HAY.

	Early cut.	Late cut.
Water.....	8.00	8.00
Protein (albuminoids).....	4.90	3.66
Ether extract (fat) .....	3.69	1.89
Carbo-hydrates (starch, &c.) .....	47.38	47.92
Fibre .....	30.60	33.69
Ash .....	5.43	4.94
	<hr/> 100.00	<hr/> 100.00



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The early cut hay is better by reason of higher percentages of protein and fat and a lower percentage of fibre. Undoubtedly the early cut hay is the more digestible of the two.

For the sake of comparison I append the analyses of Timothy and Brome hays, from grass grown on the Central Farm in 1898:—

	Timothy hay.	Brome hay.
Water.....	9.72	10.76
Protein (albuminoids).....	5.94	6.61
Ether extract (fat).....	5.38	4.51
Carbo-hydrates (starch, &c.).....	43.25	41.01
Fibre.....	31.30	31.86
Ash.....	4.41	5.25
	100.00	100.00

Other food stuffs examined were cotton-seed meal and gluten meal. These are concentrated food stuffs now largely used, comparatively speaking, in Canada. The first is imported from the United States, being a by-product in the cotton industry of the south, the second is a by-product in the manufacture of starch from Indian corn. They are both rich in protein, or flesh-forming constituents. We made several analyses of these materials as found in Canadian markets and constructed a table showing the amounts of the nutrients present. This I think will prove useful to feeders of dairy and beef cattle.

*By Mr. Cochrane:*

Q. Will you state the results of your analyses of these feeds?

A. The following table shows the comparative value of the more important feeding stuffs.

TABLE OF

Digestible nutrients in 100 pounds in certain concentrated feed stuffs.

	Protein.	Fat.	Carbo-hydrates.
Cotton-seed meal.....	37.2	12.2	16.9
Gluten meal.....	25.8	11.0	43.3
Pea meal.....	16.8	.7	51.8
Oil cake.....	28.2	2.8	40.1
Bran.....	12.2	2.7	39.2

## THE FEEDING VALUE OF THE SEED OF LAMB'S QUARTER.

Owing to the prevalence of the weed known as 'lamb's quarter,' in Manitoba and the North-west Territories, large quantities of its seed are obtained in many districts as a residue from threshing the wheat. Several correspondents having made inquiries of us in regard to its probable feeding value, we submitted a sample to analysis. We found that it was comparatively rich in protein and fat and low in fibre, qualities which give it a distinct feeding value, and which certainly rendered it too good to burn as waste, which is the common practice. It is, however, necessary to point out the danger of spreading this weed if the seed were fed unground or uncooked. The seeds are very small and many no doubt, if not previously ground or boiled, would pass through the animal undigested. The seeds would be disseminated in the resulting manure. It would therefore be better from every standpoint not to feed the seed without grinding or cooking.

*By Mr. Cochrane :*

Q. Do you consider cooking would bring out the nutritious qualities as well as grinding?

A. I think so. We have not any data to say whether cooking renders it more digestible, but I think the difference would be very small.

*By Mr. Douglas :*

Q. You recommend grinding?

A. Grinding or cooking, to destroy the vitality of the seed. Either method will answer. I imagine the food value of the seed would be practically the same in either case.

Q. I know it is frequently boiled and fed to hogs, but I haven't heard of it being ground?

A. It may be easier and cheaper for the farmer to grind the whole quantity of seed at once than to boil it each day as required, but it is a matter that must be left to the individual to decide.

*By Mr. Bell (Addington) :*

Q. What is its distinct value?

A. It is rich in fat and protein (flesh-formers) and low in fibre.

*By Mr. Douglas :*

Q. That is an important question for the North-west, and if it is going into the evidence you might as well give us the analysis, because in certain years it is very prolific.

A. I will read out the analysis:—

ANALYSIS OF THE SEED OF LAMB'S QUARTERS (*Chenopodium album*).

Moisture .....	9.82
Fat or oil .....	6.78
Protein or albuminoids.....	14.19
Fibre .....	1.27
Carbo-hydrates .....	63.91
Ash or mineral matter.....	4.03
	<hr/>
	100.00

I have said in my report 'from these results I judge the seed to be of a comparatively high feeding value. Its percentages in fat and protein, the two most important elements in foods, place it midway between cornmeal and bran.'

*By Mr. Featherston :*

Q. You just obtained that in threshing wheat, you say?

A. Yes; this sample was sent to me, and had been obtained in that way.

Q. It has not been grown as a crop to see what it will give?

A. Oh, no; it is a bad weed. That fact must not be lost sight of. Every effort should be taken to get rid of it.

*By Mr. Douglas :*

Q. The preponderance of fat will show the reason for its being used as a fuel. People put it in the stove with some wood and speak of it making an excellent fuel?

A. It is burned to get rid of it, of course.

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Q. Yes; to get rid of it. They don't know the feeding value of it. It must be bad for the land?

A. Yes; it is a bad weed, and robs the soil of much plant food and moisture.

## INSECTICIDES AND FUNGICIDES.

In our work on insecticides and fungicides we have examined several new materials, the most promising of which is 'Paragrene,' a substance advertised as an efficient and cheap substitute for Paris green. Its analysis would indicate that its toxic action should not be far away from that of Paris green and that it could be used without injury to foliage. These are its two most important points. It is sold at much lower prices than Paris green.

The practical tests of paragrene in the field and orchard have not as yet been sufficiently numerous to warrant any definite opinion with regard to its value compared with Paris green, but I have reason to think that if it is shown on further work that this product is put on the market of uniform quality and composition it will be found an economical insecticide.

*By Mr. Bell (Pictou):*

Q. Is it of the same composition as Paris green?

A. Not exactly, although it contains almost as much arsenic and almost as much copper. It is a compound.

Q. It is not arsenite of copper?

A. It is not arsenite of copper pure and simple. It is a compound or mixture consisting of aceto-arsenite of copper (Paris green), arsenite of lime, arsenious acid, sulphate of lime and probably a little free lime.

## ANALYSIS OF PARAGRENE.

Our analysis is as follows:—

Arsenious acid*.....	44.2	per cent.
Copper oxide.....	24.1	do
Lime.....	3.7	do
Sulphuric acid.....	3.5	do
Acetic acid (undetermined).		

Several recently proposed spraying mixtures and fluids have been examined and suggestions regarding their preparations and properties made. Details and particulars are given in the annual report of this division and will be found of interest to fruit growers.

## WELL WATERS.

The waters analysed during the past year indicate a somewhat better condition of affairs than heretofore. In other words a larger proportion of the water samples examined proved to be good. This is probably due to more attention being paid to the protection of the farm water supply from the infiltration of pollution. I am very hopeful of this work of water analysis, but consider it will be necessary for many years to continue it. It will also be necessary to keep reiterating the importance of pure water if health is to be maintained. We must continually point out how the farm well may become a source of danger.

\* Of this 4.56 per cent was soluble in water.



*By Mr. Bell (Addington):*

Q. Probably that result has arisen from the fact that there are more drilled wells and consequently cleaner wells?

A. Quite possibly, and farmers are not so much in the habit of sinking the well in the barn-yard as they used to be, at least, I judge so. The great cause of pollution results from the well being dug in the barn-yard, where it inevitably acts as a cess pit.

#### THE USE OF NITRAGIN FOR ENCOURAGING THE GROWTH OF LEGUMES.

Nitragin is a bacteriological preparation containing the germs that reside in the nodules on the roots of leguminous plants, and which enable the host plant to utilize and appropriate free atmospheric nitrogen. We obtain it from Germany.

*By Mr. Bell (Pictou):*

Q. Have you made any experiments with it? What is the object of its use?

A. We have made experiments with the preparation for several years with a view to ascertaining what value it possesses for encouraging the growth of the legumes and more particularly clover.

Q. How do you use it?

A. It may be used in two ways, by what we call the inoculation of the seed and the inoculation of the soil. The material itself is prepared in Germany and comes to us in the form of a jelly-like substance. This is diluted with water and the seed is sprinkled with or soaked in the fluid immediately before sowing, or the diluted preparation is sprinkled over a few hundred weights of soil and this is scattered over the field. The first is known as seed inoculation the latter as soil inoculation.

Q. Which process would you recommend as the better process?

A. I think the seed inoculation, taking everything into consideration, gives the best results.

Q. Is there any bulletin upon the subject? There should be one.

A. No, we have not published any bulletin on the subject, but our reports for 1897 and 1898 contain accounts of this material, what it is, how it is used and the results that we have obtained with it. Perhaps it may suffice if I read the following from my report for 1897.

#### THE USE OF NITRAGIN IN AGRICULTURE.

Though not generally practised as a means of soil enrichment, it has been known for many centuries that the growth of clovers and other members of the Pulse family, now commonly termed legumes, increased rather than diminishes the fertility of the soil, so that the yield of grain after a crop of clover was greater than it would have been without a previous seeding of clover. The theory generally accepted was that the clover being a deep rooted plant brought up from the sub-soil mineral matter that was out of the reach of other farm crops. This, however, appears to be but one of the causes—and that a minor one—for the fact above mentioned. The chief reason, as revealed by a recent scientific discovery, lies in the fact that the legumes can appropriate the free nitrogen of the atmosphere, assimilating and building it up into their tissues. This nitrogen, by the decay of the roots (and foliage, if the crop is ploughed under) may be utilized, after the process of nitrification, by subsequent crops. As far as we are at present aware the legumes only have this power, hence they are known as nitrogen-consumers. The demonstration that the free, that is uncombined, nitrogen of the atmosphere can be so utilized by the legumes is due to Hellriegel, a celebrated German scientist. He, with his equally renowned colleague Wilfarth, made this announcement to the world in 1886, at the same time giving overwhelming proof of the correctness of the assertion and explaining the way in

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which this appropriation and assimilation takes place. The discovery was not only a brilliant scientific achievement, but one of the greatest importance to the agricultural world.

In explaining the fact of this discovery and the application to practical agriculture, it may first be pointed out that the legumes have not in themselves the power of free nitrogen assimilation; in this respect all plants are alike. They can, however, utilize atmospheric nitrogen through the agency of certain micro-organisms, present in the soil. These micro-organisms, microbes or bacteria attach themselves to the roots of the legumes upon which nodules or tubercles then form. These contain the microbes. In some way, at present not well understood, the latter can absorb the nitrogen of the air occupying the interstices between the soil particles, converting it into certain nitrogenous compounds that enter the sap circulation of the host plant and finally are stored up in the tissues. When the nodules and their inhabitants are not present in the soil, clover, pease and all other legumes, must, like the rest of vegetation, obtain all their nitrogen from the supply in the soil existing there as nitrates.

Now, it is to be noted that these micro-organisms, though very widely distributed are not found in all soils. The question, therefore, of the possibility of introducing them where absent, or present only in small numbers, becomes one of agricultural importance. Further, if soil inoculation (as such a process may be well called) is possible, can it be made an economical method for enriching the soil with nitrogen? These are questions that come well within the scope of scientific agriculture to investigate, questions well worthy of careful research, for the answers must be of the greatest importance to farmers.

It might, at the outset, be supposed that the soil of a field growing a luxuriant crop of clover, the roots of which possess nodules, would in all probability contain large numbers of these organisms. Naturally, therefore we find the first experiments consisted in taking soil from a field upon which a legume possessing an abundance of nodules had been grown and scattering it on the field to be impregnated. This was practically soil inoculation, and though the plan in many instances proved eminently satisfactory, the carrying out of it was frequently costly and cumbersome. Dr. Nobbe, of Tharand, Saxony, was the one who first made this practical application of Hellriegel's discovery.

The next step, also taken by Dr. Nobbe, was in the isolation of the nitrogen-converting microbes from such soil and the preparation, by certain well known bacteriological methods of 'pure cultures.' These cultures consist of colonies of the organisms and the preparation has been named *Nitragin*.

It would appear that the members of the leguminosæ have each their own peculiar bacterium or micro-organism, for it seems that those influencing the assimilation of nitrogen in the clover plant are of no value for the pea crop, and vice versa. Hence, the necessity for the preparation of clover 'nitragin,' pea 'nitragin,' &c. These cultures or bacterial preparations, to the number of 17, are now manufactured on a commercial scale in Germany, and a quantity of each said to be sufficient to inoculate an acre can be procured for about \$1.25.

The practical application of *Nitragin* has been made in two ways; first by diluting the preparation with sufficient water and sprinkling the seed with the fluid, and secondly, by treating a quantity of soil with a dilute solution of the preparation, allowing the soil to dry, and then spreading it evenly over the field to be inoculated, which is then deeply harrowed.

Following these methods, experiments have been made in Germany, England and on this continent. The results so far obtained, as gathered from the reports of these investigations, scarcely admit of any more emphatic statement than that the indications are that on soils that have not previously grown legumes, or for other reasons do not contain the nitrogen-assimilating bacteria, the practice of inoculation will be attended with profit. Some soils contain such an abundance of these microbes that a further supply is unnecessary. European field experiments seem to show that even when the growth of the foliage is not increased by *Nitragin* there is frequently a greater root development and a larger number of nodules.



## RESULTS WITH NITRAGIN IN 1899.

The results of our experiments of 1899 agree, in the main with those of former years. The experiment that I wish to bring to your notice to-day was commenced in 1898; its main features are as follows: In June, 1898, two rows of clover seed inoculated with nitragin, and two rows of untreated seed were sown in soil specially selected for its deficiency in nitrogen. It was practically pure sand. The whole area sown was given a dressing of fertilizer containing phosphoric acid and potash. The crop from the inoculated seed was much more luxuriant than that from the untreated seed. In October of that year, the plants from 4 feet in each row were dug and weighed. The result showed an increased yield, due presumably to nitragin, of practically 15 per cent from the inoculated seed. The remaining portions of the rows were left undug, and it was found the following spring that the plants had survived the winter. Again the plants from the inoculated seed furnished a heavier crop—the plants being larger and the foliage much more luxuriant than from the untreated seed. Indeed the results showed that the effect on the second year's growth (1899) was more marked than on the yield of the first year—probably owing to the greater extension of the root system and the greater abundance of the nodules upon them. The introduction of these germs—according to the results of our past three year's work—has a distinctly beneficial effect upon the yield of clover. All our results point in that direction. The question therefore is, can this material be used in every day practice by our farmers? There are several reasons to my mind why at present it would not be wise to advocate its general use. Nitragin is only prepared in Germany, and it appears to be essential that it should be used while still comparatively fresh. The vitality of the germs is not guaranteed for more than six weeks from the date of manufacture of the preparation, and further it is stated that strong light and a temperature above 100 degrees F. are inimical.

If a field growing clover luxuriantly is accessible, however, effective inoculation can be made by taking some of its soil—which is sure to contain the germs in abundance—and scattering it over the poorer field, applying 300 to 500 pounds per acre, and immediately harrowing under. This method entails no great expense—unless the soil had to be brought a distance—and has been found to be successful by those who have tried it, both in the United States and Europe.

*By the Chairman:*

Q. If once a field becomes fertilized has it to be renewed?

A. I do not think so. If once a field becomes thoroughly inoculated with the germs, you will be able to grow a crop of clover in each rotation. Once having grown clover luxuriantly I don't think there would be any difficulty in having it continue.

## SOFT PORK INVESTIGATION.

In my evidence given before this committee last year, I stated that according to results obtained in our laboratories, the difference, from a chemical standpoint, between firm and soft bacon consisted in a larger percentage of olein in the fat of the latter. Perhaps I should say by way of explanation that the fat of bacon or pork consists of three fats, olein, palmitin and stearin; the last two are fats that are solid at ordinary temperature, whilst olein is fluid. It is the larger percentage of olein that gives to soft pork its peculiar and characteristic flabbiness. I further said that this discovery would enable us to ascertain by analysis whether softness was due to feed either in part or wholly—in other words we should be able to trace the effect of any particular kind of food upon the nature of the pork produced.

Following up this introductory work and with a view of ascertaining if possible the cause or causes which led to the production of soft pork, an extensive feeding trial under the control of Mr. Grisdale, Agriculturist of the Central Farm, was commenced last June. In all about 180 young pigs, between six weeks and two months



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old were put under experiment. They were all Tamworth or Tamworth grades. To learn if there were any foundation for the statement that certain districts could not produce firm pork, half the pigs were bought in western Ontario and half in eastern Ontario. I shall not enter into any detailed account of the various rations fed these pigs nor the particular conditions as to exercise, &c., under which they were kept—for those are matters, as I have said, that are within Mr. Grisdale's province; nor would such at the present moment serve any useful purpose, for I have to report that this investigation is still in progress and that until such a time as we have a complete record of the analytical data it would not be safe to draw any hard and fast conclusions. It will only be possible to-day to indicate—and that with caution—certain conclusions which I think we can draw from the data already obtained, and I ask your indulgence for a more complete report until all the chemical work is finished, which I trust will be within the next two months.

In speaking of this chemical work I may state that we are submitting to analysis the fat taken over the loin and above the shoulder. Our laboratory determinations comprise the estimation of nitrogenous tissue in the adipose tissue from these parts, as well as the percentage of olein in the fat proper, the amount of moisture and the melting point of the fat. Since the beginning of last September the chemical staff has been constantly employed on this work, practically to the exclusion of other investigations. Nearly 150 pigs have been so examined in our laboratories up to date and we are still continuing this work. Consequently we have amassed a large amount of data, but as there are still several important gaps in the series, I hesitate to-day to do more than indicate, as I have said, the trend of the results obtained.

One feature of the scheme was the examination of a certain number of pigs from each pen taken at about two months old and also a number when they had reached about 100 pounds weight. These we may term immature pigs. Their fat has invariably been found to be more or less soft, the percentage of olein usually being large. This appears to indicate a normal condition of the fat of young pigs, since under all rations it was remarked.

*By Mr. Cochrane :*

Q. What age were the pigs when they weighed 100 pounds ?

A. They would be between four and eight months, the rate would depend largely on the nature of the ration.

*By Mr. Featherston :*

Q. You fed some of them differently ?

A. There were 180 pigs and they were fed in different manners, some on corn entirely and some on a mixture of peas, barley, oats, &c., &c. The object was to find out what the quality of pork was from various feeds.

It is probable that we shall find that in order to obtain first quality bacon, even with the best rations, a certain age must be attained before slaughtering. Ripeness or maturity would seem to be an essential factor towards this end, and the practice of excessive feeding from the start so as to have finished hogs at six or seven rather than at nine months is one which we may find it necessary to deprecate. However, on this point I do not wish to be understood as stating any inference which we may not in the future have to qualify.

*By Mr. Bell (Addington) :*

Q. But you give us that as the result ?

A. Yes, all our young pork was more or less soft.

*By Mr. Calvert :*

Q. Do you mean the pork was soft ?

A. We found that a certain age or maturity is an essential factor if you are to have the pork firm.

The scheme of feeding included the use of Indian corn, both dry and soaked, and a mixture consisting of ground oats, pease and barley in equal parts. These were fed in various ways, alone and in mixtures. In many of the experiments a change of ration was made when the pigs had reached 100 pounds, thus, those fed during the first period with corn exclusively were changed on to the grain mixture and vice versa. This was done in order to ascertain the effect of the various foods at different stages of growth. That is to say, if we were to find that corn was leading to softness in the pork we might find it well to feed pigs with corn up to a certain age and then to change their rations to other grain that gave a firmer pork.

*By Mr. Featherston:*

Q. Have you made an analysis of the feeding qualities of the rations?

A. Yes.

Q. But you have not completed it?

A. Not yet. I have given one result in the case of the younger pigs. I should add that one group of pigs was fed with a ration consisting largely of beans.

Since I am not in a position to discuss in detail our chemical data, it would not serve any useful purpose for me to consider now the various conditions of feed, &c., under which this large number of pigs was kept. When this whole work is finished the entire question of the relation of feed to the quality of pork produced may be considered in the light of our results. Further, no doubt, Mr. Grisdale will bring the feeding scheme before you in his evidence. There are, however, one or two inferences that I think I am warranted in making at this stage.

The first is that a diet of Indian corn meal, exclusively, results in a poor quality of pork, the fat containing too much olein. Some of our pigs were fed exclusively on corn and we found invariably that it resulted in a poor quality of pork.

*By Mr. Bell (Addington):*

Q. I found the same thing.

A. I do not think it is either a practical or economical feed; our data show that they grow very slowly when fed corn exclusively.

*By Mr. Calvert:*

Q. In feeding young pigs right from the start are you not apt to have them too fat?

A. Yes, they should be fed to gain muscle and bone. It is best to have a good thrifty growth without fattening them, to give them a good frame and allow them to grow normally.

*By Mr. Semple:*

Q. Have you fed a ration of pease?

A. Well, not pease exclusively, but a mixture of pease, oats and barley?

*By Mr. Bell (Addington):*

Q. Good feed.

A. To what extent corn may be safely used as a ration, or whether it can be fed as a part of the ration during the first or second period of growth without affecting the quality of the pork, are important points, but I prefer to leave this discussion till we have our data completed. No doubt corn may be used, but is a question to what extent.

There are several very interesting and important features from an economical standpoint, in this exclusive corn feeding, such as I have already referred to and these no doubt will be brought before you by Mr. Grisdale.

Q. And what age the pig must arrive at before commencing with corn?

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A. I am not in a position, as yet, to say. It remains to be seen whether it should be used in commencing or finishing. Probably the safest time will be the middle period of the pig's growth.

Our second inference is that where beans form the larger proportion of the ration the pork will be more or less soft. In all the ten pigs under the bean ration the fat showed a large proportion of olein.

*By Mr. Featherston:*

Q. Larger than in corn?

A. No; from the data so far obtained the corn was the softest.

Our third inference was that pork of excellent quality can be obtained from the mixed rations of oats, pease and barley.

*By Mr. Calvert:*

Q. In what proportion?

A. One-third of each.

The chief points yet to be cleared up, and which I think this investigation will throw light upon, are the proportion of corn meal that can be used in a ration without endangering the quality of the pork, and the stage of growth at which such should be fed to ensure firm bacon as a result. Other matters are questions of locality, exercise, the feeding of green stuff, clover and roots, and all these to some extent have been made features of the present investigation. That, I think, gentlemen, concludes what I am in position to-day to say upon this important question. Very shortly we shall be able to present all the facts. The conclusions that I have stated must be regarded as marking a distinct advance towards the solution of this difficult problem.

MR. FEATHERSTON.—I must say that the experiment that was carried out at the Fat Stock Show last autumn showed that corn was not the only trouble. In the hogs from the Davis Packing Company reported as most excellent, they had been raised first on corn, and then on mixed oats and spring wheat for the last five weeks. They proved to be the best quality of meat under test last December.

THE CHAIRMAN.—I was out this last winter and over the country to many farmers' institute meetings, and I am stronger of opinion that the experiments at the Experimental Farm are not the best that could be made in the interests of the farmers. I was at one institute down at Mount Elgin, where an English farmer, living on eighty acres, came before us and gave us a thorough statement during the season of hog-feeding. He said that for a year he had cleared \$345 on hogs alone, and had raised them at \$2.45 when they came to about 180 or 190 pounds, but he fed an immense quantity of mangels along with his grain, and said that after feeding mangels along with his grain, his hogs grew more rapidly and were healthier than with any other feed. I have a son, and when I left home he had some twenty or twenty-five hogs weighing from 120 to 130 pounds. He told me he was feeding 2 pounds of meal, corn, barley and oats mixed with bran and shorts—only a little meal, but 18 or 20 pounds of mangels a day. Another lot, running about 60 pounds, got 1½ pounds of oats and 12 pounds of mangels. I am convinced that if the hogs receive a large proportion of roots, they will be the best. You will find also that 1 acre of mangels will produce as much as between 3 or 4 acres of pease and barley or oats.

*By Mr. Bell (Addington):*

Q. How were the mangels fed?

MR. McMILLAN.—Whole; let them scoop them themselves. I had two lots of ten and twelve, and before they were six weeks old, they scooped the mangels themselves. I started them very young and sliced them when they began, but they very soon scooped them for themselves. I saw a statement that, in Copenhagen, in Denmark, where mangels fed raw were a large portion of the whole feed of the hogs, and the hogs were analysed, they were found not to be injured at all.



I hold that the first work of the Experimental Farm should be to find out not only the best feed but the cheapest feed, and I hold that the corn is not the best. Roots can be produced at small cost and are a natural food of the hogs, for the hog is not altogether a grain-feeding animal.

We are exporting very largely and grow a very large amount of mangels, and there is another great thing in mangels. You can have them until the end of July if you have a proper place to put them.

*By Mr. Cochrane :*

Q. What would be a proper place to put them ?

MR. McMILLAN.—We have cellars in our barn. We give enormous quantities.

*By Mr. Cochrane :*

Q. Is this winter feeding you are talking of now ?

A. Yes, winter feeding.

*By Mr. Bell (Addington) :*

Q. I agree with you so far as the health of the pig is concerned, but I must say I attach very great importance to the experiments made by our chemist in analysing the pork to ascertain the effect of the various foods on the quality of the pork. We from experience can judge the health of the animal but we must rely on the chemist for the value of the feed and its effect upon the quality of the meat.

MR. COCHRANE.—I agree with Mr. Bell that it is very important to understand the ingredients of the feed, and of course I agree with the professor in regard to his test in pork, but I agree with the chairman fully it would be very important that such an experiment as he speaks of should be made, because it would go out with the impress of the department in connection with this feeding that the chairman is talking about. Of course it would be a revolution almost if we could produce bacon hogs at the expense that your man spoke of, but if others understood and if he can do it, of course the others can do it. It would have greater weight coming from the farm, and if we could have a test showing that the pork can be produced at that price it would be very important.

PROF. SHUTT.—There is such an experiment with mangels as part of the ration now in progress at the farm, and I shall have an opportunity of examining the flesh of these pigs next week, so we shall not only find out regarding the economy of feeding mangels up to 13 pounds a day but the effect of mangels on that pork. That is the most important point. Our central idea or object was not so much to ascertain the economic production of pork as to find out the real cause of soft pork. Because if we had a feed which was excessively cheap it would be of no value if it did not produce the kind we wanted—a firm pork. We started our scheme with this end in view and in a sense irrespective of economy.

*By Mr. Calvert :*

Q. What are you feeding with the mangels ?

A. A grain mixture, equal portions of four grains, pease, oats, barley and corn.

*By Mr. Cochrane :*

Q. In regard to the feeding value of that weed in the North-west, has wild mustard seed ever been tested for its feeding qualities ?

A. I do not think so. I should imagine it could not be so used owing to the presence of that acrid or biting principle, although I cannot speak definitely on that point. If it contains that pungent oil, just as ordinary mustard does, you could not use it for feeding purposes.

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Q. It must have a great quantity of oil in it, because the seed will lay in the soil for a great many years.

A. Yes. It is, I believe, rich in oil, but for the reason I have stated, valueless as a feed.

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Having read over the preceding transcript of my evidence, I find it correct.

FRANK T. SHUTT,  
*Chemist, Dominion Experimental Farms.*





## FATTENING FARM STOCK

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,

THURSDAY, April 5, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr. McMillan, Chairman, presiding.

The CHAIRMAN.—We have present to-day Mr. J. H. Grisdale, Agriculturist at the Central Experimental Farm, who will address us on the last year's operations in whatever lines he followed.

Mr. Grisdale then made the following statements to the Committee:

MR. CHAIRMAN AND GENTLEMEN OF THE COMMITTEE ON AGRICULTURE—I purpose this morning giving a statement and making a few remarks on feeding steers and swine. I will deal as briefly as possible with some steer experiments we have been conducting and to the end of giving you my statement as concisely as possible. I have written down a good part of it.

### PRIMARY CONSIDERATIONS IN FEEDING STEERS.

In all work in feeding steers two factors demand attention. Sometimes it is possible to bring both into prominence, but locality has much to do with the possibility. These two important factors are profit and quality. Quality in the prime steer is of two kinds, the inbred quality and the infed quality. By the inbred quality is meant that quality of blocky form, good quarters, wide loin, close ribs and deep body which comes from good ancestry, while by infed quality is meant that quality of juicy flesh, well laid on in the right place, which comes from proper feeding. Steers to command the top price must possess both kinds of quality. In buying steers to feed it is always possible to get the inbred quality if the feeder is willing to pay the price. The question of profit enters here, however, and frequently deters the ambitious feeder from investing, for, as may be supposed, such a valuable characteristic in a stocker as inbred quality at once raises him above the plane of his "scrub" bred or dairy bred mate and the price is raised in proportion, often relatively higher. Under normal conditions the margin on feeding steers is at the best small, and any miscalculation at the time of buying is very apt to result in small profits and large experience, or smaller profits and more experience still.

In experimental feeding as in general feeding the same considerations enter, and the experimenter must decide whether he is willing to risk profits for "inbred" quality and so secure the prime finished product at a considerably greater risk, or, as the alternative, be satisfied with fair "inbred" quality and by skilful feeding make the "infed" quality as high as possible and so make a profit. The "infed" quality takes with the butcher.

Where the breeder and the feeder is the same there is not a moment's doubt as to which class of steer will give the greater profit. Where two men conduct the different stages the commercial element enters to a large extent and the success of the feeder depends very much on his ability as a merchant or trader.

This is a most important consideration and one which many feeders neglect. It is a question which every man must decide for himself. When he goes into the

market and finds the quality *fair to good*, he will find he can get nothing under a high price, while a fair quality may generally be secured at a lower rate. The question with him then is, can he secure such a market as will pay him for the extra cost of securing these stockers? This consideration entered into our experiments very extensively last fall.

#### COMPARATIVE RESULTS OBTAINED FROM VARIOUS RATIONS.

We bought our steers in this section, which, as you are possibly aware, is not famed for beef cattle. It was debated as to whether it would be advisable to secure the steers in this neighbourhood or to buy them in the west, and it was finally decided to purchase here. Seventy-seven steers were selected from herds within a 20-mile radius of Ottawa, and 21 of these have been sold. I will, with your permission, give a few particulars of feeding, cost, etc.

Of the 21 steers which we have sold some 12 of them had been picked out and started in to feed considerably earlier, because we knew they were of inferior quality and we wished to get rid of them as early as possible, since the early winter market is keener, and thus we could hope to sell inferior but fairly well finished cattle in January or February at a proportionately higher figure than in April. Therefore, we started in to feed them earlier than the rest of the 21; part of them commenced in the latter part of October and early in November, and the rest on November 14. They consumed 2 tons of straw, 6 tons of hay, 30 tons of ensilage and green fodder-corn and 19 tons of roots. There were also fed 4,858 pounds of grain (corn, bran and barley)—75 per cent of corn,  $12\frac{1}{2}$  per cent of bran and  $12\frac{1}{2}$  per cent of barley. Our meal cost us at that time 75 cents a hundred, our straw \$3 a ton, hay \$5 a ton, ensilage and roots each \$2 a ton. These are the usual values put on roughage at this experimental farm, as well as at others in Canada. The steers cost us on the market \$3.47 per hundredweight. They weighed 18,130 pounds, and the gross cost for the steers alone was \$629.11. The gross cost of the feed during the whole period of feeding was \$170.69, making a total of \$799.80. We sold 7 of these steers on January 20 and 14 on March 10 for \$869.39, leaving a gross profit of \$69.59, or a net profit per steer of \$3.39.

*By Mr. Gilmour:*

Q. That is nothing for manure?

A. Yes; we have the manure.

*By Mr. Gould:*

Q. What price per pound did you get?

A. Different prices; we sold to three men. For one lot we got \$4.50 per hundredweight, for another lot \$150 for 4 steers, or about \$4.15 per hundredweight, and for another lot \$4.25.

*By Mr. Burnett:*

Q. Don't you think you made most money on the first lot?

A. No; because there were some of these we fed from the first part of October. The last lot we sold at the highest rate; we only got \$4.25 for the first lot and we got \$4.50 for the last lot, a difference of 25 cents per hundredweight.

*By Mr. Gould:*

Q. They must have been poor quality when they were sold at this price at that time of the year?

A. Why do you think so?

Q. Well, good cattle at that time bring higher prices?

A. Of what weight?

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Q. What weight were these?

A. They did not average 1,000 pounds.

*By Mr. Pettet.*

Q. What breed were they?

A. Butcher's cattle.

Q. Of what breed?

A. They had a dash of short horn.

*By Mr. Burnett:*

Q. You would not have the committee infer that is the class of cattle the farmers of this country should buy for feeding at all?

A. Oh no, these were the ones which were of inferior quality and we fed them off first.

Mr. COCHRANE—What was the intention in buying these poor cattle?

Mr. FEATHERSTON.—Experimenting in weight, I suppose, for the information of the farmers. I don't see but what the weight is something to experiment in.

Mr. HENDERSON.—Possibly the object was to show that it was an unprofitable transaction.

Mr. COCHRANE—You don't want to show that for most of us have practical experience of that too long.

Mr. GRISDALE—Some of these steers which I have mentioned here were quite well bred but small; others were not well bred at all. They were bought with a number of others because they were in a lot and the seller would not separate them from that lot without raising the price of the others beyond what they were really worth. The remaining 56 steers, which are of a much better quality and which any of you who choose may see at the farm, are being fed experimentally in a dehorning experiment and in an experiment on the age of cattle.

## METHODS OF DEHORNING AND RECORDED EFFECTS.

Before entering into a discussion on this, I should like to say something about dehorning. It is an operation which is exciting considerable interest in the country and there always seem to be a number who are anxious to find out something about it, so I think it well to give you a short sketch giving particulars about dehorning.

The facts evolved from the experience of stockmen in dehorning cattle may be briefly summarized. It is best to dehorn animals when calves, and the earlier the operation is performed after two or three days old the better. The horn "button" may be lifted out with a knife or removed with special implements made for that purpose, known as the "outcutter" and "gouge." Dehorning calves by chemicals is generally preferred to the use of these instruments. Liquid chemical dehorners are manufactured and sold to the trade and generally prove effective when properly applied, killing the horn germ and even altering the development of the head at the point on which the horn would otherwise set. Stick caustic potash will accomplish the same results, but the men who make the liquid dehorners warn against its use, contending that it makes the head sore, and thereby stunts the calf. On the other hand much weight of veterinary endorsement has been given to the use of caustic potash. To apply it, clip the hair around the embryo horn, moisten the button and rub thoroughly with a stick of potash, which should be wrapped carefully in paper to protect the fingers. In using all chemicals care should be taken that they do not run down into the eyes of the calf. The saw was first used to dehorn and is still in favour, but the superior convenience of the clipper has about driven the saw out of use. In sawing off the horns the animal's head must be tightly tied to a post or held in a chute, but this is not necessary in the use of the clipper, although the inexperienced operator will find it better to have the head secured. With either implement cut as close to the head as possible, taking a little rim of hair along with the



born. With a saw the operator can cut a little closer than with the clippers. On no account attempt to cut above the head, take a little of the skull bone rather than leave the matrix or base of the horn. If this is left stub horns will grow. Do not be afraid to cut close. The least sensitive part is just at the matrix of the horn where the arteries separate into capillaries. Much misunderstanding has existed upon this point, and many have made the well meaning but serious error of cutting about a half inch above the head. This produces an ugly wound.

Cattle may be dehorned successfully at any time of the year, provided they are not exposed to flies or severe cold. It is needless to use tar or any other preparation on the wound, except to protect it from the flies. Big horns may be as successfully removed as little horns, and the older the animal the less the loss of blood. The worst age at which an animal may be dehorned is from one to two years old. The horn is then much more vascular (full of blood vessels) than when the animal is older, and more liable to bleed. The loss of blood will be small if the horn is cut close to the head.—(*Breeders' Gazette*.)

#### COMPARATIVE TESTS WITH HORNED AND DEHORNED STEERS.

To gain some information as to the exact cost of dehorning steers in loss of flesh due to the excitement, loss of blood, and pain caused by the operation, an experiment along this line has been conducted. The steers, forty-two in number, all two-year-olds, were placed as follows:—

Lots Nos. 2 and 3 of nine steers each were tied in two rows (one lot in each row) facing each other. Lot No. 4 of nine steers was loose in a box stall, 36 feet by 16. Lot No. 6 of nine steers was tied in a box stall in a separate building, and lot No. 7 of six steers was loose in a box stall, 24 feet by 14.

Lots Nos. 3 and 4 and half of lot 7 were dehorned on November 16. The saw was used on six of them, three in each of lots 3 and 4, the Keystone clipper on six more, three in each of lots 3 and 4, the large double-action straight cut clipper on six more, three in each of lots Nos. 3 and 4, and the single-action straight cut on three in lot No. 7. The dehorned cattle as well as those in lot 2 were weighed daily for a time.

TABLE SHOWING THE GROSS WEIGHTS RECORDED.

Lot.	Treatment.	GROSS WEIGHT OF LOTS.					
		November					December
		16	17	18	20	23	5
2	Tied, not dehorned. ....	8905	8715	8525	8595	8580	8915
3	Tied, dehorned. ....	8655	8470	8370	8360	8415	8630
4	Loose, dehorned. ....	8340	8300	8270	8315	8400	8540
6	Tied, not dehorned. ....	7700				7825	7865
7	3 dehorned steers loose with. ....	2420	Not weighed	Not weighed	Not weighed	2350	2395
2	3 hornless steers. ....	2730				2752	2795

You will observe that lot 2, tied and not dehorned, weighed on November 16 8,905 and on 17, 8,715 pounds. They kept on losing, and their least weight was on November 18 when it was 8,525. They then began to gain and reached their first weight on December 5.

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*By Mr. Featherston :*

Q. How long was that after the dehorning ?

A. Dehorning was on November 16, and they weighed the same on December

5. That would be—

Q. Nineteen days ?

A. Nineteen days—or is it—yes, it is nineteen days. You know they were at changing time. We had just brought them in out of the grass in the country, and changing time is a resting time or losing time, so we can hardly ascribe the total loss of weight in these experiments to dehorning.

Q. How long after they came in did you weigh them ?

A. The day after.

Q. Just the day after they came in from the field ?

A. Yes.

Q. They would have lost weight anyway ?

A. Yes, they would. Now comes the next lot, tied, dehorned. They started off weighing 8,655 pounds on November 16. The next day they weighed 8,470, the next day 8,370, and on November 20, 8,360. They hadn't recovered their weight until December 5, so judging from the weights of these days we cannot learn anything as to the exact loss from dehorning.

Q. If you had taken steers and left them with the horns on, and taken their weights at the same times you would have had a comparison ?

A. That is what we did, the first lot were tied and not dehorned, and they were nineteen days before they got up to their first weight, that is, the weight when we put them in.

Q. Exactly so ?

A. The next lot were tied and dehorned and they came up in the same time.

Q. Dehorning did not seem to affect them at all then ?

A. It did not seem to affect them at all. The next lot were loose and dehorned. On November 16 you will observe they weighed 8,340 pounds, that was the day of dehorning. On the 17th they had lost 40 pounds, the 18th they had gone down to 8,270, and on the 20th their weight was 8,315. On the 28th they had increased to 8,400. You notice they were up on the 28th, and on December 5 they had gained 200 pounds over the weight they were when dehorned.

*By the Chairman :*

Q. They did not suffer as much ?

A. No, they did not seem to suffer as much.

*By Dr. Sproule :*

Q. These were two-year olds, I understand ?

A. Yes, two-year olds. The next lot were nine steers tied, but not dehorned. These were in a separate building and not affected by the excitement which seemed to have some effect upon the others. The nine weighed 7,700 pounds on November 11, 7,825 on the 28th. They made a slow gain right through. The excitement which the dehorned lot underwent seems to have communicated itself in some measure to the horned lot, which were facing them, the blood was flying around a little which seemed to affect them seriously. Then we had three dehorned steers loose with three hornless steers. We had bought three which had been dehorned some time previously. The three dehorned steers weighed at the start 2,420. We did not weigh them every day but on November 28 they weighed 2,350 pounds, and on December 5, 2,395. The three hornless steers on November 16 weighed 2,730 pounds, and on November 28 2,752 pounds, and they had gained a very little by November 28, whereas the dehorned steers had lost 70 pounds. I may say that the hornless steers abused the dehorned ones as they were unable to protect themselves. Their horn stumps were sore and they couldn't defend themselves against the hornless ones. Lots Nos. 2 and 3 it will be observed regained their original weight

about the same date. Lot No. 4 took only six days to recover from the operation, for on November 21 they weighed 8,245 pounds, which was 5 pounds above their weight on November 16. The check lot in separate stables, designated lot No. 6, was not weighed daily but made slow steady progress. The dehorned steers in lot No. 7 lost considerable weight and did not recover till December 20. This was doubtless due, as I have said, to their being loose with the other steers which were not sore and besides were larger steers. These latter it will be observed made some gain.

While no positive conclusions may be reached as to the exact cost of dehorning, it would appear from a comparison of lot two with lot four and of the dehorned part of lot seven, with the hornless part of same lot, that no great set back is suffered by steers from this operation. It was observed that nervous irritable individual animals were much more affected than sluggish phlegmatic ones. It must be remembered that all these steers had just been stabled and so would of course, be making very little progress in any case during this period. A time of change is a time of loss or at best, rest. No great difference was observable in the effect of the different instruments in dehorning, save that there was practically no blood lost where the saw was used. One animal in lot three, dehorned with the Keystone clipper lost a great deal of blood, but in no other case was there serious bleeding.

*By Mr. Featherston :*

Q. Do you think that was caused by the cracking of the base of the horn ?

A. I think it must be. The horn of that steer had been clipped very close, but although that is the advisable method, the better method of clipping, it still seemed to bleed very much.

Q. Do you think they heal up as quickly as the sawn ?

A. No, they do not.

Q. The reason is that the horn is more or less cracked or splintered ?

A. Yes, I think that is the reason ? In those three steers, the clipper cut on only one side, and seemed to crush. It took a long time to heal up.

Q. The base of the horn was crushed, no doubt ?

A. Yes.

*By Mr. Stubbs :*

Q. Have you had any experience in dehorning aged cattle ?

A. No.

Q. My experience is you will find it harder there. It injures the interior laminae of the horn ?

A. It is harder to cut. There will be less bleeding in aged cattle because the capillaries are fewer, but it is more difficult to cut the horn off. It does not make any difference how old the animal is.

*By Mr. Gilmour :*

Q. That is just the question, what age is the best ?

A. While I have not had experience with aged cattle here, I have had experience outside in clipping big horns. I clipped the horns of a four-year old bull once and it took two men to handle the clipper.

*By Mr. Stubbs :*

Q. Did you have a good clean surface, and how did you clean it ?

A. We had the same thing in both the lots. Both lots healed very rapidly.

*By the Chairman :*

Q. They will not bleed very much with the saw, I think ?

A. Oh, no.



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*By Mr. Featherston :*

## CARE OF WOUNDS FROM DEHORNING.

Q. Another thing you want to guard against is allowing the cattle to run out among the straw stacks where they will get chaff or anything in the wound?

A. We had ours all tied up or in a clean box stall, and I cannot speak from experience, but I should judge it was a very important consideration. We had one steer of the last lot—whether it was due to getting some dirt in it or not, I do not know—but it sloughed off a good deal.

Q. And made his head sore?

A. Yes; and he was afraid of the others and did not thrive.

*By the Chairman :*

Q. What did you use?

A. A little bit of pine tar, that is all.

Q. We use a weak solution of carbolic acid and that cures it at once.

A. This did not last very long, it was not very serious. I suppose it was about a month after the operation was performed before it was all healed.

*By Mr. Stubbs :*

Q. They do better without any medical treatment at all. The trouble is on account of careless treatment. When you cut into the cavity there are air chambers there and, of course, if anything extraneous gets into them it is liable to get down into the nasal chambers.

*By the Chairman :*

Q. We have three or four on which the horn had begun to get better and the white mucous that came to the surface to heal the wound became corrupt.

*By Mr. Stubbs :*

Q. Was there a discharge from the nose?

A. No, from the horn.

*By Mr. Featherston :*

Q. To prevent that put a little piece of absorbant cotton along there. It keeps foreign substances out and prevents foreign substances affecting the nasal and chest chambers.

The WITNESS—The case we had is different. It seemed to be the interior of the horn that was affected and considerable matter came out of that. When we were clipping him I suppose a cupful of viscous whitish fluid came out of the horn.

*By Mr. Stubbs :*

Q. Evidently it was diseased before?

A. Evidently, although the horn was clean and bright-looking, and we saw nothing to indicate disease beforehand.

## COMPARATIVE GRAIN IN WEIGHT BY AGES.

In connection with the dehorning experiment we are using the same steers along with others to gain some data as to the comparative economy of feeding three-year olds, two-year olds and yearlings. The yearlings had been fed up to April 1 with roots, ensilage, hay and straw, alone, receiving no grain. We have started to

feed grain now and expect to finish off in June. Below are a few particulars of these three lots and their comparative gains.

Lot 1, three-year olds, when they went in on November 14 they averaged 1,118 pounds. The average gain since that time has been 204 pounds.

That is when they went in they were weighed about ten o'clock, having had their breakfast. Their weight to-day is estimated without any breakfast at eight o'clock, so you see they are really fasted. In fasted weight they have gained 204 pounds.

Lot 2 of two-year olds, tied and dehorned, averaged in weight 959 pounds when they went in, and have made an average gain of 190 pounds, fasted weight. You see they have really gained more than that, because the first weight is not fasted and the last is.

*By Mr. Featherston :*

Q. Were they weighed in off the grass or how ?

A. They had been in the stable one day, just off the grass.

Q. And had been fed that morning ?

A. Yes, that morning. They were weighed between ten and eleven hundred pounds.

*By Mr. Semple :*

Q. For what length of time was that gain made ?

A. From November 14 to March 28, no March 14. They gained on the average of fasted weight 1·55 pounds, something over a pound and a half a day fasted weight. The next day I weighed them at ten o'clock after being fed in the morning, and I found it made a difference of 500 pounds on the nine steers. So, estimating them at the increased weight at the same hours, we found an average increase of 2·09 pounds a day. That is, they made an average daily gain of over 2 pounds a day from November 14 to March 14.

*By the Chairman :*

Q. They were both fed and watered in the morning ?

A. Yes.

*By Mr. Featherston :*

Q. How long had you them in ? Did you weigh them ? Were you experimenting right along every month ?

A. From November 14.

Q. Were they weighed between that and March ?

A. Yes,

Q. Under similar circumstances I suppose each time ?

A. We weighed them every two weeks. On March 14 and 15 we weighed them the two ways. We weighed them the one way on the 14th, and on the 15th we weighed them the other way.

Q. Yes, but what I want to get at is, when you weighed them first, how long were they in, two weeks or a month ?

A. Two weeks. Part of that lot were weighed every day in the dehorning experiment. The next recorded weight I have here is December 20. We weighed them on December 5 also.

Q. They went in on November 14 ?

A. Yes.

Q. When weighed on December 20, in what condition were they ?

A. The same as the first time ; we did not change them till March.

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Q. When were they weighed after December 20 ?

A. They were weighed every two weeks.

Q. What was the gain of this lot; they would be weighed under similar circumstances ?

A. Yes.

Q. What was the gain ?

A. I have the totals here. The totals on November 14, when they went in, was 10,065 pounds.

Q. That is the average ?

A. No; that is the total.

Q. They pulled up after ?

A. On December 20, they weighed 10,505 pounds; on January 17, they weighed 10,810 pounds; on February 14, the total was 11,318 pounds.

*By Mr. Featherston :*

Q. What date in February ?

A. February 14.

Q. That is from January 17 to February 14 ?

A. Yes.

Q. That is where you get the comparison of weight under the same conditions ?

A. Yes.

Q. What was the weight at the end of the experiment ?

A. On March 14 they weighed 12,185 pounds.

Q. How many steers ?

A. Nine.

*By Mr. Sproule :*

Q. In feeding these, did you cut all the hay and straw they used ?

A. Not the hay.

Q. Only the straw ?

A. We cut the straw and fed the chaff and mixed it with ensilage and roots and fed them with long hay.

Q. Pulped roots ?

A. Pulped roots. There was considerable advantage in feeding long hay; we found if we cut the hay it was not so beneficial.

*By Mr. Featherston :*

Q. When did you feed the long hay ?

A. After the ensilage and roots.

Q. In the morning ?

A. We fed mixed ensilage, roots and chaff, and then over the top of that we scattered grain, and an hour and a half afterwards we fed them the long hay.

Q. That was in the morning ?

A. At eight o'clock. We fed them again at half-past four with long hay.

Q. I always feed my cattle with long hay in the morning. I think it prevents the fine food going through too quick; I find it comes up with the cud in better shape ?

A. I always noticed the cattle like to have something to chew on for a time after they have been fed.

Now the dehorning part of this experiment. Lot 2 were two-year olds tied and not dehorned. They averaged 959 pounds when we put them in and they gained 190 pounds each, or an average of 1.44 pounds each per day under the same conditions. I have the totals of their weight here also. Lot 2 weighed 8,635 pounds on November 14, 8,960 pounds on December 20, 9,290 pounds on January 17, 9,789 pounds on February 14, and 10,185 pounds on March 14.



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The two-year olds loose and dehorned, that is the corresponding lot to the two-year olds tied and dehorned, weighed 8,650 pounds to start with, or an average of 961 pounds, and the lot have gained 1,686 pounds, or an average of 187 pounds per steer, practically the same you see.

Q. In what length of time?

A. That is from November 14, to March 14, four months. Lot 3. The yearlings, as I told you, were fed with no grain. They weighed 7,275 pounds to start with, an average of 808 pounds each, and they have gained 743 pounds, an average of 83 pounds each, or two thirds of a pound each per day; that is without grain.

Q. And they running loose?

A. No, they are tied up.

Q. Yearlings?

A. Well you see they would be two years old in the spring.

Q. What are you feeding these on?

A. Roughage without grain.

*By the Chairman :*

Q. Did you buy them?

A. We bought them.

*By Mr. Sproule :*

Q. It would seem that those running loose did the best?

A. The ones not dehorned had put on 190 pounds each and the ones which were dehorned gained 187 pounds each. I may say that the ones which were running loose for a time did not do very well, that is during part of December and part of January, as you will see by looking at their weights.

*By Mr. Featherston :*

Q. What is the reason?

A. I cannot tell you.

Q. I noticed that the three-year olds from January 17, to February 14, gained 508 pounds, but from February 14 to March 14, they gained 867 pounds.

A. From the middle of February to date they have been gaining exceedingly well. The three-year olds are gaining three pounds a day, the two-year olds nearly three pounds a day, both dehorned and loose.

Q. Since February?

A. Since the middle of February.

Q. What do you attribute the gain to?

A. Several things. For one thing I was there in February to March, the other time I was not there?

I may say that it is hard to get hired men entirely reliable. I was away for three weeks and I was suspicious of one of the men. I got home at ten o'clock one night and went right down to see the cattle. There was, I suppose 10 to 15 pounds of feed before each steer; that is enough to kill the profits of any steer. Of course I put the man out of that. They are doing better now but he hurt them some.

*By Mr. Featherston :*

Q. Was he trying to overfeed them?

A. No, it was just carelessness. He was not interested in cattle, that was the matter, and did not know when a steer had enough.

*By Mr. Sproule :*

Q. Do you curry them often?

A. All those that are tied.

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Q. Every day?

A. Oh yes, every day. We cannot get at those running loose very well unless you get them when feeding.

## THE FLOORING OF STALLS.

We have some experiments on the flooring of stalls. If any of you have been up at the farm you will have noticed we have raised the stalls to economize in bedding and we have one kind of stall there which has given very good results indeed. It has required no bedding at all. It is an economy in one way, if you are short of bedding, but of course it does not make as good manure, more or less of the liquid manure is lost, but it is very economical in bedding and it keeps the steers very clean.

*By Mr. Sproule :*

Q. What is the nature of the floor?

A. It is raised about 6 inches above the level. We did not like to disturb the original flooring of the stall but the new flooring is put in laid on three separate beams.

*By Mr. Featherston :*

Q. Scantlings like?

A. Yes, and the scantlings run lengthwise on the stall, about an inch apart and they are open at the top part and closed at the back. They are just the right length so that the manure drops over the end and the floor is practically clean all the time.

Q. How do you clean it out from under the slats?

A. With a hoe.

*By Mr. Featherston :*

Q. There is 6 inches of space underneath?

A. No,  $4\frac{1}{2}$  inches.

Q. And you have a scraper you can get underneath.

Y. Yes, we have a scraper we can use.

*By Mr. Gilmour :*

## BEDDING PIGS.

Q. Have you tried any experiments in bedding pigs?

A. We had some experiments in bedding pigs in the same way. Some of them were raised only four inches, and we found we would have to abandon the plan on account of the smell.

Q. I had them in four years ago and had to throw them out. I couldn't clean them out at all.

A. We have another part with a sloping floor, where we keep our breeding stock pigs, here there is a sleeping bed about six inches high at the back, but about fifteen inches high in front, and of course it is quite easy to clean underneath it; that is all right. Where the bed is only six inches high all over, however, it won't work, and it is not much more economical in bedding either.

## COMPOSITION OF RATIONS FED TO STEERS.

We fed these yearling steers a roughage ration of 45 per cent of roots, 45 per cent of ensilage, 8 per cent of hay and 2 per cent of straw. This was, to put it in pounds, 23 pounds of roots, 23 pounds of ensilage, 4 pounds of hay and 1 to  $1\frac{1}{2}$  pounds of straw per day.

*By Mr. Sproule :*

Q. You say 45 per cent of roots ?

A. Yes ; 45 per cent of roots.

Q. And of ensilage 45 per cent ?

A. Yes. The grain ration is three-quarters, or 75 per cent of corn,  $12\frac{1}{2}$  per cent of bran and  $12\frac{1}{2}$  per cent of barley. In addition to this the two-year olds and three-year olds received a ration of oil meal, the three-year olds getting two-thirds of a pound per day and the two-year olds half a pound per day each. The yearlings we have just started on two pounds of the mixture without the meal oil.

Q. What did you say was the percentage of ground feed ?

A. 75 per cent of corn,  $12\frac{1}{2}$  per cent of bran and  $12\frac{1}{2}$  per cent of barley, ground of course.

*By Mr. Featherston :*

Q. What is it, American corn ?

A. Yes.

*By Mr. Semple :*

Q. What is the reason you have not oats in the rations ?

A. Because we have a lot of barley and we want to get rid of it, and so we want to feed it. We are scarce on oats, so we fed barley.

*By Mr. Bell (Addington) :*

Q. Which would you have preferred to feed, oats or barley ?

A. Oats as compared to barley are as good, at the very least. Now, gentlemen, that is all I have to say on steers, unless you have something further to ask.

*By Mr. Featherston :*

Q. Some feeders of stall fed cattle I have known, in Nova Scotia, have the idea that they ought to tie their steers so that they cannot lick themselves while being fattened. They would not give them any chance to lick themselves. What might be the reason of this prevention ? Do you think there is anything in that ?

A. I do not see where it would be of any benefit. I cannot say from experience. Our steers are tied, as you know, so that they can move themselves around very easily.

*By Mr. Sproule :*

Q. I did not get what you said was the percentage of ground feed—the mixture you fed ?

A. Seventy-five per cent of corn.

Q. I know that, but what I want is the quantity that you fed of that mixture ?

A. Oh, I do not know whether I can give it to you—I have it here. We fed the large steers 6 pounds of the mixture, and  $\frac{2}{3}$  of a pound of oil meal per day.

*By Mr. Featherston :*

Q. That is all they were getting of the meal ?

A. That is all the meal they were getting. The two-year olds, tied up, dehorned, and those not dehorned are getting 5 pounds and  $5\frac{1}{2}$  pounds of the meal. The loose ones are getting  $5\frac{1}{2}$  pounds. I may just say here that the two-year olds dehorned, loose, are making very rapid gains, almost as rapidly at present as the three year olds, but they eat a little more.

Q. More than the three-year olds ?

A. No, not more, but quite as much, and more than the other two-year olds.



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*By Mr. Bell (Addington):*

Q. More than the two-year olds not dehorned?

A. Yes, or more than those tied up and dehorned. They are eating more than any other two-year olds; they eat on the average 8 pounds of roughage per day more and  $\frac{1}{2}$  a pound more of meal.

Q. Do they clean it up well?

A. Yes, and we cannot get the tied up ones to eat as much.

Q. Do they grow better?

A. No, the dehorned ones, loose, are now growing better than the others but they did not for a while.

*By Mr. Erb:*

Q. In your opening remarks you referred to farmers buying steers for fattening and to the question whether he would pay the higher price for the superior steer or be satisfied with a fair inbred quality, and by skilful feeding endeavour to secure a fair return. From your experience which could you make the most money from?

A. It depends upon how good a buyer he is. If you can get hold of a good steer at the right price it will pay you to buy the good steer, but you will find that if you go to buy the best steers, the farmer knows which is the best as well as you, and he wants a little better than the proportionate price on them, because he thinks these are the gems of his herd and he wants to keep them for his own use, or, if he sells them, he wants to make up on them for the poorer ones.

*By Mr. Featherston:*

Q. You adopted the best system I think. You sold out the poorer cattle first?

A. Yes.

Q. That comes to the conclusion that you do not want to feed the poorer class of cattle?

A. By all means.

*By Mr. Hurley:*

Q. Why not sell the good ones?

A. You can keep the good ones and make good gains right along. The poorer cattle will make good gains part of the time, but it won't do to keep them any longer. From a number of experiments conducted last year it was found that the common kind of animals, dairy cattle, made just as much gain per day, but when you came to sell them there was a difference of \$1.50 to \$2.00 per hundred, less, so that if you can get your poorer animals up to a fairly good condition and sell to a local butcher, as we did, it is better to do so. You could never sell them to a big butcher.

*By Mr. Sproule:*

Q. Is as profitable to feed two year olds as three year olds?

A. The yearlings I have been feeding for growth and for filling up and they have done very well indeed are in splendid condition now. They are now gaining rapidly and I expect to have them make 150 pounds, between now and June. The experiment is right along the line of the question I should like to hazard an opinion.

Following are the tabulated schedules containing the records of the test, in detail, from November 14 to March 14.

## THREE-YEAR OLDS.

(WEIGHER'S REPORT.)

## LOT I.

No.	November 14.	December 20.	January 17.	February 14.	Fasted weight March 14.	Usual weight March 15.
38.....	1,105	1,140	1,160	1,231	1,290	1,340
58.....	1,020	1,090	1,160	1,203	1,221	1,292
20.....	1,020	1,065	1,105	1,155	1,241	1,292
60.....	1,035	1,085	1,110	1,175	1,230	1,273
55.....	1,075	1,170	1,170	1,274	1,275	1,355
96.....	1,145	1,205	1,235	1,268	1,294	1,347
97.....	1,285	1,335	1,395	1,463	1,491	1,552
56.....	1,190	1,215	1,230	1,274	1,312	1,367
61.....	1,190	1,200	1,245	1,275	1,314	1,367
Total.....	10,065	10,505	10,810	11,318	11,666	12,185

## Two-YEAR OLDS, NOT DEHORNED.

WEIGHER'S REPORT.

## LOT II.

No.	November 14.	December 20.	January 17.	February 14.	Fasted Weight, Mar. 14.
49.....	1,060	1,070	1,135	1,194	1,236
37.....	965	975	1,039	1,076	1,100
98.....	950	1,025	1,055	1,098	1,148
24.....	1,030	1,080	1,115	1,197	1,263
44.....	935	985	1,000	1,076	1,125
85.....	925	970	995	1,045	1,103
100.....	980	1,005	1,015	1,060	1,100
17.....	900	920	960	995	1,013
30.....	890	930	980	1,048	1,097
Total.....	8,635	8,960	9,290	9,789	10,185

## Two-YEAR OLDS, DEHORNED, TIED.

WEIGHER'S REPORT.

## LOT III.

No.	November 14.	December 20.	January 17.	February 14.	Fasted Weight, March 14.
S 50.....	1,050	1,050	1,120	1,047	1,180
S 42.....	965	965	1,015	1,076	1,132
S 40.....	960	965	1,015	1,075	1,107
K 43.....	1,020	1,060	1,125	1,160	1,189
K 53.....	935	950	965	1,045	1,075
K 81.....	925	900	905	950	949
L 13.....	995	1,015	1,055	1,123	1,170
L 04.....	915	935	975	1,017	1,045
L 02.....	890	910	965	1,024	1,048
Total.....	8,655	8,700	9,130	9,517	9,895

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## TWO-YEAR OLDS, DEHORNE, LOOSE.

WEIGHER'S REPORT.

## LOT IV.

No.	November 14.	December 20.	January 17.	February 14.	Fasted Weight, March 14.
S 99.....	1,055	1,100	1,125	1,195	1,223
S 103.....	965	970	1,010	1,058	1,093
S 23.....	935	940	980	1,003	1,043
K 101.....	1,025	1,010	1,030	1,081	1,105
K 80.....	935	920	920	988	1,008
K 73.....	930	935	975	1,048	1,074
L 54.....	965	1,010	1,035	1,098	1,126
L 90.....	910	890	940	1,012	1,056
L 51.....	930	970	1,000	1,083	1,084
Total.....	8,650	8,745	9,015	9,566	9,812

## YEARLINGS.

WEIGHER'S REPORT.

## LOT V.

No.	Nov. 14.	Dec. 20.	Jan. 17.	Feb. 14.	Fasted Weight, Mar. 14.
94.....	875	920	920	937	977
31.....	865	905	915	934	983
15.....	860	870	870	896	930
93.....	840	855	855	878	914
29.....	810	840	850	876	914
78.....	740	775	780	788	811
64.....	720	765	780	800	820
95.....	705	745	755	768	790
67.....	685	700	720	760	768
Total.....	7,275	7,375	7,445	7,637	7,907

WEIGHER'S REPORT.

## LOT VI.

No.	Nov. 14.	Dec. 20.	Jan. 17.	Feb. 14.	Fasted Weight, Mar. 14.
79.....	905	940	965	995	1,021
11.....	885	915	945	975	1,021
86.....	865	890	920	920	966
63.....	865	895	915	960	976
85.....	840	875	915	935	977
87.....	840	840	900	900	950
89.....	835	855	885	930	920
88.....	835	860	865	910	948
82.....	830	855	880	930	949
Total.....	7,700	7,925	8,190	8,505	8,728



## FATTENING QUALITIES OF DIFFERENT BREEDS.

*By the Chairman :*

Q. That experiment of yours with cattle. It was not the Jerseys that gained as well as the Durhams?

A. All the pure breeds were tried and the main crosses and all gained nearly as well as the best bred animals, but when we came to market them the difference came in.

*By Mr. Featherston :*

Q. They were inferior as fat cattle?

A. Yes.

Q. Selling at four and a half in January, you got a better price than the price now?

A. It was four and a quarter in January and four and a half in March.

Q. The same quality?

A. Yes, but the ones in January were a little larger. They were of no better quality but slightly larger.

*By Mr. Sproule :*

Q. In your experiments in root feeding you used a very large percentage of corn and no oats? Did you find it cheaper?

A. Yes, we can get our corn for 80 cents a hundred.

*By Mr. Featherston :*

Q. Was it ground?

A. Well, it costs us about a cent a hundred to grind it. That is what we paid for it on the market. We bought by the earload, and we can get oats at about 35 cents a bushel, 35 cents for every 34 pounds, something over a dollar a hundred. Corn will fatten more quickly than oats, although corn is not so good for the growing animal, and we find that it is much more economical to feed corn at that rate and add a little oil meal to balance the ration than to buy oats and feed them.

*By Mr. Stubbs :*

Q. Did you find any difficulty in selling the Holstein at as good prices as the other cattle?

A. We haven't had any experience here, but in other places where they have tried them they have not been able to sell nearly so high. The Short Horn and Polled Angus, in an extensive experiment in Illinois, commanded in the Chicago market \$2.50 a hundred more than the dairy cattle.

*By Mr. Bell (Addington) :*

Q. My experience is that it is not a very profitable undertaking to feed Holstein steers for beef?

A. It is not profitable, for they put the fat on where it is not wanted; they fill up with fat inside. Last year I said something on that subject. We had some animals that we examined in that respect last year.

*By the Chairman :*

Q. Some of those Holsteins, the Holstein that gave the milk at London last summer, was as well made an animal as you can get.

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*By Mr. Featherstone :*

Q. The finest cow I ever saw as a milch cow.

A. Don't you think, Mr. Chairman, if she was fed up she would have put the fat inside ?

The CHAIRMAN.—I think all the milk breeds will do that.

*By Mr. Bell (Addington) :*

Q. It is not a profitable undertaking ?

A. No, unless the fat is put on the right places it is not profitable.

*By Mr. Featherston :*

Q. The Polled Angus from the Western States commands the highest price in London ?

The CHAIRMAN—So it does in Scotland.

Mr. FEATHERSTONE—And the butchers are careful in taking the hide off to leave a piece on the foot to show the breed ?

A. Yes.

*By the Chairman :*

Q. Every time I was home I visited the markets and I used to consider a Polled Angus about 1,200 pounds would bring as much money as a Durham of 1,400 pounds. Have you had any experience with a cross of Durham and Polled Angus ?

A. They are considered to be the best animal, I believe. I have never had any experience with them, but that is what I have heard from Scotch farmers.

Q. One experiment you should make, if you can, that is to raise a few steers, breed and raise them, and show the difference in the cost of bringing the animal to market standard when raised up to the time it is sold, against the cost of the animal you purchased.

A. We have an experiment along that line at present. We have not got all the calves we want, because we find them very hard to get ; in fact, I have written to every man I know having a short horn bull, but I have only three calves yet.

*By Mr. Featherston :*

Q. In talking of experiments of that kind it would be well to take stock of these cattle every year or every six months and charge up the price they would bring on the market, say, to go to the States.

A. That would be given.

Q. And show what disadvantage or advantage it would be to treat them all along.

*By the Chairman :*

Q. We breed so many we never keep an animal till it is more than two years and six months old. I have a letter from my son in reference to an animal of his. He was a calf two years ago. Last year he weighed 700 pounds and in January he weighed 1,250 pounds. I have a pair of steers up from Mr. Stubb's county and they are a long way fatter than anything else I have got.

*By Mr. Sproule :*

Q. Am I correct in the understanding that the milking strains, whether steers or cows, put the fat on principally inside instead of outside.

A. Yes ; around the kidneys.

## EXPERIMENTS IN PORK PRODUCTION.

We have conducted a number of experiments in pork production recently. We have one here and I might just say a few words about it. An extensive experiment to determine if possible the causes of 'soft' pork is being carried on. The experiment was incepted, as you are aware, in July, 1899, a class of pigs of nearly uniform breeding were secured partly in western Ontario and partly in this district. The pigs were all half, or more, Tamworth bred. The Tamworth was selected as giving the highest percentage of 'straights,' 'selects,' or 'singers.' It was also easier to secure pigs of this breed in the west than of the Yorkshire or Berkshire. It is hoped and expected that considerable valuable information may be secured relative to the influence of feed on the firmness or softness of bacon.

I might mention incidentally that some peculiar examples of the effect of a uniform ration of feeding stuff lacking in bone and flesh producing elements are to be seen in the pens at the experimental farm. Some of the pigs fed on corn, at the time we got them, were about eight or ten weeks old and they are about the same size yet. This is a very peculiar example of the effect of feeding corn right along. This is of course a strictly corn ration; it is not the corn ration the average farmer uses to feed, throwing in slops and other things in handfuls to keep up the appetite.

*By Mr. Calvert :*

Q. You fed grain ?

A. Yes, grain.

*By Mr. Hurley :*

Q. Had they any run ?

A. Some had a small run till the snow came.

*By Mr. Bell (Addington) :*

Q. They are the same pigs still ?

A. Practically the same; they did not look as decent from the start.

*By Mr. Calvert :*

Q. How old are they ?

A. Eleven months.

*By Mr. Featherston :*

Q. Ten weeks old when you got them ?

A. Yes.

*By Mr. Erb :*

Q. Were they stunted before you got them ?

A. No; their brothers and sisters are probably in England by this time.

*By Mr. Sproule :*

Q. Did you give them any milk ?

A. No, it was a strictly corn ration.

*By Mr. Calvert :*

Q. You gave them water ?

A. Yes, water of course. We have only a few pens like that; I think there are seven or eight in that condition just to see what they would do.



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*By Mr. Featherston :*

Q. Do you feed the other pens in the same way ?

A. In exactly the same way.

*By Mr. Semple :*

Q. Did you try feeding pure barley ?

A. Not with these.

*By Mr. Sproule :*

Q. What do you intend to do with them ?

A. We have some feeding on a good deal of corn. We are feeding some pens on corn till they are 100 pounds, and then we feed them on oats, pease and barley. Then others are fed on oats, pease and barley until they are about 100 pounds and then put on corn, and some of these are not up to 180 pounds yet. We are keeping this small lot till the others are ready, and then we will kill them off.

## TRIAL FEEDING OF PIGS ON RAPE.

*By Mr. Calvert :*

Q. The chairman told us the other day about feeding mangels, have you tried them ?

A. Yes ; but I will first give you the results of our experiments in feeding pigs on rape. On 2nd August last we put two lots of six pigs each on a rape plot of about one-fifth of an acre. This rape had been sowed in drill on May 20, but, owing to wet weather, had made rather poor growth, and so was only about fifteen inches high at the date of turning in the pigs. For some time after their introduction, they failed to eat much of the crop, especially the younger lot. Very little grain was given, however, and finally both lots fed heartily upon the juicy young plants. The growing rape was pretty well eaten down by October 1, and from that date till November 30, an allowance of four pounds of rape per pig was fed daily from another field. The five remaining after November 30 received as much mangels as they would eat, about four pounds each daily. I don't know whether I mentioned they were not all the same size ; some of them were large and some of them were not, and one of them died early in September, and the remainder were fed after November 30 on mangels at the rate of four pounds a day. That is all they would eat. They had not been accustomed to mangels, and we could not get them to eat more. The average weight at the start, of the large ones, was 64 pounds, and the average weight at the finish was 183 pounds. The average gain was  $119\frac{1}{2}$  pounds, an average daily rate of gain of 1.004 pounds. They were fed for 119 days.

TABLE GIVING PARTICULARS OF INCREASE IN DAILY RATE OF GAIN.

Lot No. 1.	First Weight.	Last Weight.	Gain.	Days Fed.	Daily Rate of Gain.	Remarks.
No. 81.....	59	176	117	119	.97	
82.....	69	190	121	119	1.02	
83.....	56	180	124	119	1.04	
84.....	64	190	126	119	1.06	
85.....	76	191	115	119	.97	
90.....	59	173	114	119	.96	
Total. ...	383	1,100	717	119	* 1.04	* Average rate of gain,

*By Mr. Sproule :*

Q. How long were they kept on the rape ?

A. They were kept on the rape right up to the finish, that is this lot.

*By the Chairman :*

Q. Was the rape tested ?

A. Yes.

*By Mr. Sproule :*

Q. You put them on the rape on August 2 ; how could you keep them 116 days on rape ; the snow would come about November 1 ?

A. Not last year.

Q. No ; I guess it would not.

A. They were on from August 2 till November 30, 116 days they were on the rape.

Q. Did you not have snow on the ground at the end of November ?

A. Not this year. Now, the smaller lot of pigs weighed only 36 pounds at the start and at the finish they weighed 176 pounds, so that they gained 140 pounds on the average.

*By Mr. Featherston :*

Q. You fed these the same way ?

A. We fed them the same way till the end of November, and after that they were fed on mangels with grain. One pig in this lot No. 2 died, as I have said, after being fed for 35 days.

TABLE SHOWING DAILY RATE OF GAIN FOR LOT 2.

Lot No. 2.	First Weight.	Last Weight.	Gain.	Days Fed.	Daily Rate of Gain.	Remarks.
No. 86.....	32	165	133	148	.90	
87.....	32	190	158	148	1.07	
88.....	30	161	131	148	.89	
89.....	38	170	132	148	.90	
91.....	54	202	148	148	1.00	
.....	30	45	15	.....	.....	Died Sept. 6.
Total.. ...	216	923	717	148	* .95	* Average rate of gain.

Pigs in lot No. 2 appeared to be too young to introduce upon rape, as they did not thrive for about a month after being confined in the lot. The dew or moisture from the plants seemed to affect them, causing their skin to crack. Lot No. 1 was not affected in the same way at all. I might give you a statement of the cost and proceeds of eleven finished hogs. Eleven pigs at an average of \$2, \$22 : rent of lot, \$2 ; 3,000 pounds of rape and roots, at \$2 a ton, \$3 ; 4,402 pounds of meal at \$1 a hundredweight, \$44.02 ; making a total of \$71.02. The proceeds of 1,988 pounds of pork at \$4.50 a hundredweight were \$89.46, a net profit of \$18.44. This is taking eleven pigs. It was, of course, impossible to determine the quantity of rape grown on the lot, so a rental of \$2 is charged for the one-fifth of an acre.

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## PACKER'S REPORT ON QUALITY OF PORK.

I have got a final report on the two lots killed and reported upon by the George Matthews Packing Company, Limited, Hull. The first lot were rather mixed breed, two Poland Chinas, three Chester Whites and one Yorkshire.

*By Mr. Sproule :*

Q. What do you say you fed besides the rape ?

A. Oat, peas and barley in equal parts, half this mixture and half corn.

*By Mr. Calvert :*

Q. Is that \$4.50 live weight ?

A. Yes.

*By Mr. Bell (Addington) :*

Q. How did you feed, dry ?

A. Yes, we have tried several experiments and find that the most economical so far. The lot of six which were killed on November 30, turned out as follows—we have the pigs numbered for the purposes of the experiment—No. 81 had a live weight of 176 pounds, a dressed weight of 120 pounds, and dressed 72.7 per cent. The yard criticism was “straight” and the quality was given as “poor.” No. 82, live weight 190 pounds, dressed weight 136 pounds, dressed 71.6 per cent, “straight,” “fair.” No. 83, live weight 180 pounds, dressed weight 133 pounds, dressed 73.9 per cent., “straight,” “very poor.” No. 84, live weight 190 pounds, dressed weight 136 pounds, dressed 71.6 per cent, “straight,” “very poor.” No. 85, live weight 191 pounds, dressed weight 144 pounds, dressed 75.4 per cent, “straight,” “fair.” No. 90, live weight 173 pounds, dressed weight 125 pounds, dressed 73.7 per cent, “short,” “poor.” The lot was a very inferior quality, and not good pork.

*By Mr. Featherston :*

Q. What was the trouble ?

A. They were all soft. Of course, as I have told you, they were Poland Chinas, Chester Whites and Yorkshires. Now the rest were a cross, a Yorkshire and Chester White cross. They were all classed as “straight” by the yard man at the Matthews place.

Q. That is they were selects ?

A. Selects or singers, and two of these were classed as good quality and the other three as very good, that is they were the very best. The particulars furnished about them were as follows: No. 86, live weight 165 pounds, dressed weight 125 pounds, dressed 75.7 per cent, “good.” No. 87, live weight 190 pounds, dressed weight 137 pounds, dressed 72.1 per cent, “very good.” No. 88, live weight 161 pounds, dressed weight 118 pounds, dressed 73.3 per cent, “very good.” No. 89, live weight 170 pounds, dressed weight 121 pounds, dressed 71.2 per cent, “very good.” No. 91, live weight 202 pounds, dressed weight 147 pounds, dressed 72.7 per cent, “good.” These were killed on December 29. The date of killing is given because, though all were treated in the same way till November 30, after that date the remaining pigs were fed roots instead of rape. It will be observed that the second lot were all firm in quality, any one of them being superior to the best in the first lot killed on November 30. From these we got very good returns, whether it was owing to not feeding them on rape I don't know. They were fed on mangels, starting at 2 pounds a day and increasing four pounds, so that we were feeding about 6 pounds a day at the close.

Q. How long were they off the rape ?

A. About a month.



*By the Chairman :*

Q. Mangels there did not seem to have a bad effect ?

A. No, not in that case.

#### COST OF PRODUCTION.

As to the cost of producing this pork, the two lots produced in all 1,434 pounds, during the period of the experiment. The cost of feed was \$49.02, thus making the cost of 100 pounds increase, \$3.42. This being very materially less than the average cost of producing pork on grain alone, is thus of considerable interest. Had the pigs been from earlier litters, a still lower cost per 100 pounds increase would doubtless have been the result, since the cold weather necessitated a larger grain ration. It would appear also that pigs of the weight of 30 pounds were rather young to place on a rape ration.

*By Mr. Sproule :*

Q. What was the size of the field of rape for these pigs ?

A. About one-fifth of an acre, I cannot give the exact measurement.

*By Mr. Featherston :*

Q. At the outset you say you started in with the Tamworth cross, as they were considered best for experiment ?

A. No, that is in the large experiment. I said: "A class of pigs of nearly uniform breed were secured, pigs of the Tamworth breed being selected as giving a higher percentage of 'straights,' 'selects' or 'singers.' It was also easier to secure pigs of this breed in the west."

*By Mr. Erb :*

Q. While being fed on rape had they a warm, dry place to sleep ?

A. Yes.

#### BEST BREEDS FOR BACON.

*By Mr. Bell (Addington) :*

Q. Have you experimented sufficiently to say what breeds and crosses are best to produce long-side bacon ?

A. I cannot say that we have experimented at the farm sufficiently, but I would not be afraid to venture an opinion.

Q. Well, your own opinion ?

A. My own opinion is that the Yorkshire, Tamworths and their crosses and the new improved Berkshires, not the short Berkshires, of which there are too many in the country, are the best for this purpose. The Berkshire, I may say, must be fed carefully or there is a tendency to have a rise on the shoulder which spoils the long side.

Q. I find a good cross is the Berkshire and Yorkshire ?

A. Yes, that is a good cross. Tamworth and Berkshire is not a good cross as we have found out.

*By Mr. Featherston :*

Q. It gives a fatty pork ?

A. We find we cannot get good bacon from it. I think Tamworth and Yorkshire is the best cross.

Q. The Chester Whites and Yorkshire cross, do very nicely ?

A. Yes, those that we had here, were Chester white and Yorkshire crosses and they were all good.

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*By Dr. Sproule :*

Q. I do not think you gave the quantity of corn you fed these pigs per day ?

A. No, I did not give per day. I haven't it here but I have the total amount. That is all.

Q. Give us the total amount ?

A. They ate 4,402 lbs of meal.

*By Mr. Semple :*

Q. How often did you feed the animals per day ?

A. Three times a day ; small feeds at noon and larger feeds at morning and night. I believe pigs should be fed three times per day, while I advocate feeding cattle only twice, the pigs have only one stomach while the cattle have three. We know some feeders feed only twice but I don't think they get as good results. It would be interesting to try an experiment along that line, I have never done so however.

*By Mr. Featherston :*

Q. Feeding three times a day depends I think a great deal upon the age of the hogs. If they are young they should be fed four or five times ?

A. I think so.

Q. But after they get up to six months then I believe twice a day is enough ?

A. You do.

Q. I do. I had a young sow last fall, that was put away from the house altogether on account of disease, and she gained 150 pounds from the time she came back from the show. That would be about the first of October, until the time of the Fat Stock Show in London.

A. One hundred and fifty pounds.

Q. In that time ?

A. In two months.

Q. A little over two months.

A. That is remarkable.

Q. She was fed only twice a day because she was some distance from the house and the boys had to draw the food to her, with a horse.

A. That is a tremendous gain for a pig.

Q. Well she weighed it. She weighed 190 pounds when she went to the Toronto Show, thence to the Fair at Ottawa, and was away a month, and I know she didn't get anything extra in that month. She came back about the last of September, and when weighed afterwards was found to have gained 150 pounds.

A. I have here a report of experiments on feeding with mangels, clover, and grain. I was called by Mr. MacLeod to attend this meeting a few days sooner than I was expecting ; I heard one of the other officers was to appear before you to-day, and I wanted to get as much data as possible in relation to this experiment and we are not quite ready yet to give you a full report. I have a partial report I can give you if you desire to hear, but I would rather wait until it is further advanced.

*By Mr. Bell (Addington) :*

Q. Cannot we adjourn until Mr. Grisdale can give us the full report ?

The CHAIRMAN.—I think it would be much better. This is a very important matter, and Mr. Grisdale can come before us again on Wednesday.

COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
WEDNESDAY, April 11, 1900.

The Select Standing Committee on Agriculture and Colonization met this day at 10.30 a.m., the Chairman, Mr. McMillan, presiding.

Mr. J. H. Grisdale, Agriculturist, being recalled, said:—

TRIAL FEEDING OF HOGS ON MANGELS, CLOVER AND GRAIN.

MR. CHAIRMAN AND GENTLEMEN,—I have just to detain you for a very few minutes to finish up my evidence began before you on the 5th instant. The experiments I have to bring before your attention is one we have been conducting on the fattening of pigs on mangels, clover and grain. We had three lots of six pigs each. They were put in to fatten on January 9 of this year and weighed then 73 pounds on the average. They had been farrowed in the latter part of September and the first part of October and were of rather mixed breed. Some of them were Yorkshire-Tamworth breed, others Tamworth-Poland China and others Tamworth-Berkshire crosses. We put an equal number from each litter into the breeding pen, so that as far as breeding is concerned the experiments were all the same.

Lot 1 was fed on mangels and grain, the grain being half grain and half oats, pease and barley in equal parts. Lot 2 was fed on clover and grain, the same mixture. Lot 3 was fed on grain alone, the same mixture.

*By Mr. Rogers :*

Q. All ground?

A. Ground and fed dry. Drinking water was given in separate trough.

THE MANGEL LOT started off with 5 lbs. of mangels pulped and one lb. of grain per diem each. This was increased at intervals until each pig was being fed  $12\frac{1}{2}$  lbs. of mangels per diem. The grain ration was increased also, and each pig was finally eating 3 lbs. per diem in addition to the mangels. This was just at the last. To finish them off in the last three weeks we fed them a large grain ration which they took freely. Up to date, April 3, they had eaten 962 lbs. of grain and 5,347 lbs. of mangels. They had gained 558 lbs. in weight. Each pound of gain in live weight had required 1.72 lbs. of grain and 9.58 lbs. of mangels. The average daily gain was 1.09 lbs. per pig. The average cost to produce 100 lbs. gain live weight was \$2.68. The average gross gain was 93 lbs. per pig.

*By Mr. Wilson :*

Q. Does that include the cost of taking care of them or only just the cost of feeding?

A. Only just the feed. Now we have a report from the packers on these lots, but I will read the reports on the different lots together.

THE CLOVER FED LOTS started off with 1 lb. of meal per diem and  $1\frac{1}{3}$  lbs. clover chopped and steamed. The grain was gradually increased to 3 lbs. and the clover to  $1\frac{1}{2}$  lbs. Up to date, April 3, they had eaten 971 lbs. of grain and 828 lbs. of clover. They had gained 444 lbs. in weight. You will notice they did not gain nearly as much as the mangel-fed lot or the grain-fed lot. Each pound of grain in live weight required 1.18 lbs. of grain and 1.9 lbs. of clover. The average daily gain was .87 lbs. The average gross gain was 74 lbs. The average cost to produce 100 lbs of gain live weight was \$2.68. That is exactly the same as in the mangel-



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fed lot. They took more grain but would not eat as much clover. We fed them all the clover they would take. It was steamed slowly and they drank the water from that as eagerly as if it were milk.

Q. Was it ripe clover put away to steam?

A. It was cut a little on the green side, it was lucerne.

Q. What time of the year was it fed?

A. We are just feeding it now.

*By Mr. Broder :*

Q. You cut it up?

A. Yes, and they drank the water in which it was steamed.

Q. I experimented on them and they would drink the liquid as quick as milk.

A. They are very fond of it indeed.

*By Mr. Wilson :*

Q. That is the same in that case as the other, that you do not charge anything for the care?

A. Oh no, we balance the manure against the care.

*By Mr. Broder :*

Q. The raising of clover will not be any more expensive than the raising of mangels?

A. I am assuming the clover to cost \$5 per ton.

Q. An acre of mangels would keep more hogs than an acre of clover?

A. Yes.

Q. You have more value?

A. Although we only fed  $1\frac{2}{3}$  we got 2 tons to the acre of the second crop.

*By Mr. Rogers :*

Q. Did you give all the mangle's they would eat?

A. Yes.

*By Mr. Broder :*

Q. Did you ever try heating the mangels?

A. No.

Q. Some people talk about that being an advantage?

A. I don't see any advantage in it.

Q. Mixing a little meal or something with it and heating it. They claim it brings out the fattening qualities?

A. I don't believe it does. From experiments tried elsewhere it appears that the only root food that improves by heating is the potatoe. If you want to feed potatoes you must cook them. That has been demonstrated at this experimental station and at others. You must cook them or they are valueless.

*By Mr. Wilson :*

Q. Is that for cattle or for hogs?

A. Just for hogs. They are very good for breeding stock, acting as a stimulant or tonic.

*By Mr. Erb :*

Q. In assuming the cost, did you make any allowance for the fuel used in heating the clover?

A. No.

*By Mr. Wilson :*

Q. I think you should make closer estimates than that and charge up everything it costs you and then credit the manure.

The CHAIRMAN.—It is almost impossible to estimate the manure.

The WITNESS.—I think the manure is worth the trouble.

*By Mr. Wilson :*

Q. It is largely a guess anyway; it may be a guess with the manure but you are only guessing the manure and not all the items?

The CHAIRMAN.—Farmers generally make an estimate of all the feed consumed and the results and allow, as Mr. Grisdale has said, the manure to go for the work in feeding.

*By Mr. Broder :*

Q. I think if you are testing something the farmer raises against something the farmer buys, then that theory might apply. But when it is a comparison between feeding clover and mangels, both of which the farmer raises, I think this mode is the best means of deciding?

A. That is what this experiment has in view.

*By Mr. Wilson :*

Q. Still there should be an estimate of the cost of the fuel and labour because you get nearer in that way than by guessing three or four items.

The CHAIRMAN.—A good many don't count that fuel, for they don't burn the fuel for that, they have the stove going and it does not take any extra fuel.

*By Mr. Wilson :*

Q. I fancy that is not the case at the Experimental Farm?

A. Yes, it happens to be the case. We heat our feed from the dairy and that has to be going so it does not cost anything. But it should be taken into consideration and for that reason I never advocate cooking feed, for it does not pay. But this is an experiment simply for feeding clover.

*By Mr. Broder :*

Q. Have you ever tried experiments with raw turnips?

A. No, but we have with sugar beets and they succeeded fairly well.

Q. The quality of pork made of mangel is much better than most people suppose it to be?

A. I have part of a report this morning dealing with that.

The grain lot were started with  $3\frac{1}{2}$  pounds of grain per diem and gradually raised to 4 pounds. Up to date April 3, they had eaten 1,783 pounds of grain; they had gained 577 pounds in weight. Each pound of grain in live weight had required 3.09 pounds of grain.

The average daily gain was 1.13 pounds.

The average gross gain had been 96.17 pounds.

The average cost to produce 100 pounds gain live weight in grain \$3.09. That is the cost of the feed alone.

In estimating the cost of 100 pounds live weight barley, peas and oats have been valued at \$1.20 per hundredweight, and corn at 80 cents per hundredweight, that is ground grain.

Roots (mangels) are put at \$2 per ton.

Clover hay is put at \$5 per ton.

It is only fair to state that the lot on clover are likely to raise their record cost of 100 pounds gain in live weight since only two have reached maturity. The lots

## APPENDIX No. 1

on mangels and grain seem to be maturing together, four from each lot having gone to the packer. I have the packer's report upon these pigs. We sent ten over from these lots ; four from the grain lot, four from the mangel lot, and two from the clover lot.

*By Mr. Rogers :*

Q. Did you find 4 pounds of grain enough for them ? Was it all they would eat ?

A. It was all they would take and have a good keen appetite for the next meal.

## GRAIN FED.

Pig.	Live Weight.	Dressed Weight.	Percentage Dressed.	Yard Criticism.	Packer's Criticism.	Per cent of Firmness.
152	195	142	72.8	Thick .....	Very good .....	75
161	178	132	74.1	Straight .....	" .....	75
157	168	123	73.2	" .....	Good .....	70
158	170	125	73.5	" .....	Excellent .....	80
Average....	177½	130.5	73.4	.....	Very good .....	.....

## MANGELS AND GRAIN FED.

156	186	126	67.7	Straight .....	Poor .....	50
154	183	125	68.3	" .....	Good .....	70
153	195	136	69.7	Thick .....	Medium .....	65
160	170	115	67.6	Straight .....	Fair .....	60
Average....	183½	125½	68.4	.....	Medium .....	.....

## CLOVER AND GRAIN FED.

159	180	130	72.2	Straight .....	Very good .....	75
155	182	130	71.4	" .....	" .....	75
Average....	181	130	71.8	.....	.....	.....

## RESULTS IN WEIGHT AND QUALITY, AT FINISH.

The lot fed on grain averaged 177½, dressed weight 130½, the average percentage dressed being 73.4. The criticisms were three "straights" and one "thick", and the packers criticism of the quality of the meat, "very good," "good," "excellent."

*By Mr. Broder :*

Q. Is that grain fed ?

A. That is grain fed. They were all very good and were first class meat.

The mangels and grain average 183½ live weight 125½ dressed weight, percentage dressed 68.4.



*By Mr. Broder :*

Q. They shrank more ?

A. Five per cent increase in the shrinkage, The grain-fed dressed 73.4 and the mangels and grain-fed 68.4. The yard criticism was three "straights" and one "thick". Practically the same there. The packer's criticism after killing was the first one "poor," the second one "good", the third one "medium" and the fourth one "fair". The quality was medium on the average. The clover and grain lot averaged 181 live weight, dressed 130, percentage dressed 71.8. You notice there is little difference between the two as far as weight went. Both were straights and both qualified as very good quality.

You could not see better bacon for quality so far as firmness was concerned than the grain fed pigs. Suppose 100 to be very "hard," as hard as it is possible to get pork, then these six fed on grain average 75, the four on mangels average 65 or ten per cent lower and the ones on clover averaged 75. For our own use, I may say as we have been killing a great many pigs lately, we have established a sort of percentage of hardness. It is not used by the packer but by ourselves only, and these are our own figures, the packer's criticisms were as I gave you there, but these are our own.

*By the Chairman :*

Q. Do you continue to feed the total quantity of mangels up to the time of marketing ?

A. Yes, almost up to the time. We have two in that lot yet and two in the grain-fed lot and four in the clover-fed lot. You see some of them didn't come until the middle of October, and some in the middle of December.

*By Mr. Wilson :*

Q. They would hardly thrive as well in winter as in summer ?

A. I think they would. We have a good, well sheltered place.

The CHAIRMAN.—My own opinion is that in feeding mangels the pigs should be taught when very young to feed on them. We taught them when they were still suckling and kept feeding them until within three weeks of their going away, and then withdraw the mangels except a few.

A. I believe that is a very good thing.

*By Mr. Broder :*

Q. You make the difference in cost between feeding grain and mangels ? It is greater in grain than in mangels.

A. Yes. In mangels it was \$2.68, in grain \$3.09 per hundred pounds gain.

Q. That is not overcome by the increased weight and quality, is it ?

A. No, oh, no.

*By Mr. Hurley :*

Q. You had no soft bacon in any of your experiments ?

A. Yes ; one pig was poor in the mangels lot and the others were medium or fair.

Q. Only one out of all that quantity ?

*By Mr. Henderson :*

Q. How do you explain that ? Why should one pig be poor and the others good, if all were fed alike ?

A. I explain it by the difference in maturity. I think that the mature pig is one that is likely to be firm.

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*By the Chairman :*

Q. Was it a younger pig than the others, or was it smaller ? The soft pig ?

A. No ; they just weighed the same apparently. It was about the middle of September pig.

*By Mr. Wilson :*

Q. Had it always been healthy ?

A. Yes ; it was about September 20 or 25 pig. The pigs were not all born on the same day, and October 15 pigs are running yet. But you will often get one pig out of a litter, which grows slowly and which when killed is likely to be soft.

*By Mr. Henderson :*

Q. Do you think that one kind of hog will mature at an earlier age than the others ?

A. I believe they will, but we must take into consideration both hardness and fatness, the fat kind generally mature a little earlier than the others. They may be quite firm, but on account of the extra amount of fat they are not good quality and will not do for bacon. This experiment, however, deals only with softness or hardness exclusively and has nothing to do with the degree of fatness. Two of these pigs were classified as thick and had very thick and fat shoulders, although they were firm.

*By Mr. Rogers :*

Q. Is the cost of dressed pork greater from grain than from the mangels ?

A. The cost of the dressed weight in the grain-fed pigs was \$4.21 per cwt., and the cost of the dressed meat in the mangel and grain-fed lot was \$3.91.

*By the Chairman :*

Q. I have generally observed that there is one pig in the same litter that does less than the others ?

A. The little one is generally of poor quality.

*By Mr. Broder :*

Q. The little one is whipped out at feeding time and does not get as much as the others.

*By Mr. Erb :*

Q. Your figures appear to show that the pigs fed on grain cost \$3.09 per hundred pounds of live weight gained and the cost of the lot fed by grain and mangels was \$2.68 per hundred pounds of gain live weight. It would appear from this that as long as the buyer cannot distinguish between the mangel and grain-fed pigs, it would be cheaper for the farmer to raise mangel-fed pigs, although it makes an inferior quality of bacon.

*By the Chairman :*

Q. You can raise as much mangels on one acre of land as you can of pease, barley or oats on two or three acres, so that taking all things into consideration mangels are much the cheapest feed.

*By Mr. Rogers :*

Q. Is not the cost of raising mangels much greater ?

*By the Chairman :*

Q. Yes, but if you put the cost of an acre of mangels against the cost of three acres of grain that tells and you have beside improved your land very much by the cultivation. .

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Having read over the preceding transcript of my evidence of April 5th and April 11th, I find it correct.

J. H. GRISDALE.

*Agriculturist.*



## POTATO RAISING.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, April 11, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day, at 10.30 o'clock a.m., Mr. McMILLAN, Chairman, presiding.

Mr. W. T. MACOUN, Horticulturist at the Central Experimental Farm, was called and submitted the following statement:—

MR. CHAIRMAN AND GENTLEMEN,—I am very glad indeed to have the opportunity of bringing the work of my department again before you. I have, as you are aware, charge of the horticultural department at the Central Experimental Farm. This includes the fruits and vegetables, forest trees, and the Arboretum and Botanic Garden. But as, during the past few years, when the horticulturist came before you he gave evidence regarding his work among the fruits and forest trees, I should like very much to devote the most of my time to discussing vegetables, and would speak particularly of potatoes. But if, after I have finished speaking about the potato, there is any other part of my department you would like me to take up, I shall be very glad indeed to do so. I think that, as the potato is one of our most important food products, the results obtained from experiments in growing this vegetable are well worth a place in the reports of this committee.

### THE WORLD'S POTATO CROP.

The following figures will give you an idea of the value of the world's potato crop, from which you will see that it is a very important one. Recent statistics give the number of acres devoted to potatoes as 29,768,491 and the amount of the crop as 3,772,518,319 bushels. The potato is grown most largely in Germany, where they devote over seven million acres to this crop. England obtains the largest yield of potatoes per acre, there being an average yield in that country of about 233 bushels, while in the United States there is an average yield of considerably less than 100 bushels to the acre. In Ontario we do a little better, the average for the past seventeen years being 115 bushels. The yield in Ontario is small, however, and it seems to me that it could be at least doubled if proper methods of cultivation were adopted.

### INTRODUCTION OF THE POTATO.

It may interest you to know that the potato has been in cultivation in civilized countries for less than 400 years. It was brought over to Europe by the Spanish when they were colonizing America, in 1553. It was introduced into Ireland in 1585 or 1586, by Sir Walter Raleigh, when some of his colonists were returning to Ireland from Carolina or Virginia, after which it was used by the poorer classes of the Irish as one of their articles of diet. But it was not until the latter part of the eighteenth century that the potato came into general use; that is about 150 years ago, and the great acreage devoted to this crop to-day has been developed since that time. It appears that during the latter part of the eighteenth century a famine in Scotland caused the potato to be very largely grown there, and this made its use

become more general. The potato is a native of Chili, South America, and belongs to the *Solanaceæ* or nightshade family. In the first botanical description of the potato, published by the French botanist de l'Ecluse in 1601, he says that from one tuber planted fifty could be produced; but these were of unequal size and only from one to two inches long. It would thus appear that the yield of potatoes was then quite as great as regards numbers as it is now, but the size of the potato was very small. In its native haunts the potato very frequently grows quite close to the surface of the ground, and the tubers then are green and unfit for use, but by improved methods of cultivation the potato has become one of our best food products.

#### IMPROVEMENT OF THE POTATO.

As has already been said it is only during the last one hundred and fifty years that the potato has been grown very generally, and consequently most of the improvement in this vegetable has been made within that time. To give an idea of the number of named varieties that are now existing, it may be said that the late H. Vilmorin, Paris, France, recently published a list of eight hundred and forty kinds.

We have tested over four hundred varieties at the Experimental Farm, and it has been found with few exceptions that the potatoes of American origin have given better results than those from Europe. In Europe they have a longer season to mature in, and when we bring them over here where the season is shorter they do not do as well.

The varieties of potatoes have originated in three different ways. The first method probably adopted was to select from the wild tubers. That is to say, the largest tubers would be selected from the hills until a better class of potatoes was obtained. Another way in which new varieties were obtained, and the way now being adopted by the best growers, is to produce them from the seed. It is a very simple matter to do this, and one which any farmer can take up if he has a small garden. The seeds when removed from the seed balls are treated like tomatoes, and the young plants are put out in the field at about the same time. In the autumn there will be potatoes from the size of marbles up to the size of a hen's egg. Only the best of these are saved. By selecting the best types from the most productive hills the following year; keeping these separate and planting again and selecting, new varieties will be obtained. One of the best potatoes, Carmen No. 1, was originated in this way, and there are many others. A great number of our nursery men's varieties are got by selection. For instance the Early Rose potato is taken. The potatoes are taken from the strongest growing vines and the most productive hills, and by continuing this selection for a few years a better and more productive variety may be obtained. There is the Everett, for instance, a potato which you cannot tell from the Early Rose when you mix them together, but that potato will yield more than the Early Rose, is as good in quality, and its equal if not its superior in other respects.

*By Mr. Rogers :*

Q. All potatoes have not seed balls?

A. No, I was going to say that of late years it is impossible to get seed balls from most varieties. The Early Rose on the experimental farm and on most farms does not produce seed balls, and to get improved forms of this variety you have to select from the best hills, from those potatoes having the shallowest eyes, &c. The principal reason why potatoes do not produce seed balls nowadays is that they have been grown from tubers and not from seeds, with the result that the tuber has increased at the expense of the seed.

The third method by which new potatoes may be originated is by crossing, that is by applying the pollen of the flower of one variety to the pistil of another, but this is very difficult as there is very little pollen now on the potato blossom, and the result is that few potatoes are originated in this way.

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## COMPARATIVE YIELD PER ACRE.

As was said before, the average yield for Ontario is 115 bushels to the acre. In 1898 the average yield of fifteen varieties of field crops at the Central Experimental Farm was 240 bushels to the acre. That year the average in Ontario was only 84 bushels to the acre; that was a difference of 156 bushels to the acre at the experimental farm. One of the principal reasons for this difference is due to planting the best varieties. There have been a large number of varieties grown there, and after testing them for several years to discover which are the best varieties, we know now which are the best sorts to plant. Of the fifteen varieties grown in the field in 1898, there was a difference of 127 bushels 20 pounds per acre between the poorest and the best variety. The best variety was the American Wonder, which yielded at the rate of 299 bushels 35 pounds to the acres, and the poorest was the May Queen, which produced at the rate of 172 bushels 15 pounds, so that there was a great difference in varieties in that case.

Q. The American Wonder was the best one?

A. That year.

Q. Quality considered?

A. Yes. Of course, there are a great many things to take into consideration in recommending a variety. The American Wonder has a white skin, and there are many markets where you cannot sell a white-skinned potato. In Ottawa, for instance, you cannot easily sell potatoes with a white skin, whereas further west a white-skinned potato is about the only one they will take.

## QUALITY OF SOIL AND PREPARATION OF LAND.

I think that one of the most important reasons why farmers do not get as good results from potatoes as they should is that they have too many crops to look after, and unless the potato crop is well looked after it will not be large. No farmer is wise to plant potatoes only on the soil best suited for them. It appears to me it would be more profitable to vary his rotation so that he can bring potatoes on potato land every year if he has it. We have found that the best soil for potatoes is a sandy loam. There are several reasons for this. A sandy loam never bakes, and if a farmer has not time to look after his crop as he should, his land may bake, if it is heavy, and his crop will be small. Another of the most important matters in successful potato culture is the preparation of the soil. As you know, the potato matures in a comparatively short time. The plants do not come up, probably, until June, and we often get blight, if potatoes are not looked after, about the end of August, so that the potato in most cases only has that short space of time to grow. So it is very important to have the soil in the best possible condition at the time of planting. Where it can possibly be brought about the plan is to use clover sod land for potatoes. Potatoes seem to do best where there is decaying vegetable matter in the soil. It is not wise where the soil is loamy to plough in the autumn for potatoes. By not ploughing it then you prevent much plant food from being leached away, and by ploughing early in the spring the land can be thoroughly prepared before it is time to plant the potatoes. One cannot say what is the best method of bringing the land into condition for potatoes, as no one method would apply to all kinds of soil, as a great deal depends on the character of the soil and the time the farmer has at his disposal. But the nearer the land can be got into a thoroughly pulverized condition, to the depth of 6 inches, the better the crop that will be obtained. In our sandy loam soil at the Experimental Farm we can bring this condition about by ploughing, disc-harrowing twice, and then harrowing twice with the smoothing harrow just before planting. It has been found that by making the drills for the seed  $2\frac{1}{2}$  feet apart the most economical results will be obtained. A double mold-board plough is used in making the drills, and they are made from 4 to 6 inches deep. The potato sets are then planted, 1 foot apart in the rows.



This brings up the question of the cutting of potatoes of which I would like to speak for a little while.

*By Mr. Semple :*

Q. You might mention about manuring land ?

A. I omitted that. I think it would be wise to apply to the land at the time of ploughing under the clover, a fair dressing of manure, but not more than ten tons to the acre. In our experimental plots, (I am not now speaking of field crops), we do not often apply manure directly to the potato crops because we can not get quite as fair results, where we are comparing so many varieties together, as we can where the manure is well rotted in the soil as it would be difficult to distribute manure so accurately that every variety would be treated alike. In our experimental plots at the farm we get very large yields where no manure is applied directly to the crop. In 1899, there was one variety which yielded 640 bushels to the acre in the experimental plots. Of course one would have to allow considerable reduction on this if he were growing them by the acre but it just shows that if one puts the labour on the land and plants the best variety the crop would be very much increased. The potatoes produced at the rate of 640 bushels to the acre were on sandy loam soil from which a crop of tobacco was taken in 1898. Tobacco exhausts the soil considerably so that the land was not very rich on this account.

*By Mr. Rogers :*

Q. You put the ten loads of manure to the acre on this ?

A. Not on this acre. When I said that I was speaking of field crops. Of course in experimental plots we are growing varieties side by side and we modify the system somewhat on account of the soils at our disposal.

Q. You put some manure on the plot where you get the 640 bushels ?

A. Not in 1899, there was some, however, put on for the tobacco crop in 1898. We believe when manure is used that it should be thoroughly mixed with the soil. Thus one would not put the manure in the drills where the potatoes are to grow. We had a bad experience in doing this some years ago when the potatoes were very badly scabbed. And other experimenters also have found that fresh manure which comes directly in contact with the potatoes is likely to make them scab.

*By the Chairman :*

Q. You will have to cultivate deeper for your potatoes than you ordinarily do where you follow shallow cultivation, because the shallow cultivation only goes down three or four inches.

A. I was speaking of the preparation of the land before the planting.

Q. You would have to plough deeper than is generally done ?

A. We plough about eight inches deep and then prepare about six inches. It is pretty hard to get down deeper than that with a harrow. We plough eight inches and then harrow from four to six inches deep.

*By Mr. Erb :*

Q. What kind of harrow do you use to get down six inches ?

A. A disc harrow. But it is difficult to get down to that depth on some soils unless a spring toothed cultivator is used.

#### CUTTING AND PLANTING POTATOES.

I believe that potatoes should not be planted too early for the main crop because they are liable to be checked by frost when they come up, and the soil also is cold early in the season, but each should use his judgment in this regard as much depends

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on when frosts occur and when droughts are liable to take place. But if an early crop is wanted of course it is better to plant early and run these risks. By planting them early it is better to cover the sets more lightly as the potatoes will come on more quickly because they will be in warmer soil.

*By Mr. Pettet :*

Q. We have best luck with early planting.

A. What do you call early ?

Q. In the early part of May.

A. In Picton, where you are not as much troubled with frost as we are here, that would do. Everyone should use his own judgment in this particular.

*By Mr. Semple :*

Q. What time would you recommend planting potatoes as a field crop ?

A. Any time after the middle of May. As I said we never have a failure on the Experimental Farm by planting this way. We plant about the 24th of May and always have good crops.

With regard to cutting potatoes, experimenters all over the world have tried different methods and some have come to one conclusion and some to another, but there are some general principles which are proven so far which I may give you. For instance it has been proven that the larger the potato planted the larger crop you will get, but that is not the most economical way. It has also been proven that the larger potato you plant, the larger proportion of small potatoes you get, as a rule.

Q. In the hill ?

A. Yes.

Q. If you plant it whole ?

A. Yes. But very few do that. There is only a certain amount of plant food available in the soil and the point is to plant the potatoes in such a way as to utilize this and get the best and largest crop in the most economical way. We have found at the Experimental Farm that it pays to plant a good sized piece with from two to three eyes. For instance, take this potato, it should make four pieces.

Q. How would you cut it ?

A. Right down the centre and then across in this way, so as to make four quarters, the seed end being cut through the middle. Potatoes having more eyes than that—perhaps that has more than some ; here is one which would illustrate it better—if you have a potato with many eyes you should arrange to leave not more than three or four eyes to a piece. But it is not so much a matter of the number of eyes as of the size of the piece you plant. We have had as high as 200 bushels to the acre from eyes just gouged out with a little piece of flesh, but we only got this in a damp season. It does not pay to plant potatoes like that. As a rule, one only can get 50 bushels or less to the acre, even if good cultivation is given. It has been found that it is better to use a good sized piece.

*By Mr. Hurley :*

Q. How many go in a hill ?

A. One piece, a foot apart in the drills. That is the conclusion we have come to.

*By Mr. Bell (Picton) :*

Q. Do you ever cut off the eyes at the top, that is, the seed end ?

A. We have tried them that way but we can get as good results from the seed ends. It is a great mistake throwing away the seed end of the potato.

*By Mr. Rogers :*

Q. It is done sometimes with small potatoes ?

A. Yes.

*By Mr. Hurley :*

Q. In the old country they have a great habit of throwing away the seed end of small potatoes. My father used to do that, and the poor people got them and grew better potatoes than we did ?

A. My father-in-law happens to be an Irishman, and when I was over in Ireland a few years ago, I found that he used the seed ends of potatoes to get an early crop. This is also the custom of some in this country.

*By Mr. Hodgins :*

Q. Do you plant small potatoes ?

A. Yes, for experimental purposes, and get good results from them, but if one is planting the same seed every year, they will not continue to give as good results. We believe in planting our best looking potatoes. It often seems to a farmer a waste of money to put a fine potato like that (exhibiting a fine specimen) in the ground, but it pays him to do it.

Q. Last year I sowed large potatoes, cutting them, and I found that small potatoes of another variety did better ?

A. Well, variety in that case probably made the difference ; as I have said, there is a wonderful difference in variety. I grew this potato plant (showing a large plant with young tubers already formed) to show you that if a piece is planted in the soil, all the eyes do not grow. The eyes grow in proportion to the size of the piece you plant, so that if you plant the seed end of the potato, though you may get a few more stalks, they will not be anything in comparison with the number of eyes planted in the piece.

*By Mr. Semple :*

Q. What varieties do you consider the best ?

A. Well, I was going to speak on the subject of varieties later on, but I may say that in our experience the best varieties for farmers to grow would be, for white skinned potatoes, American Wonder, Empire State, and Carmen No. 1 ; and for pink potatoes, Everett and Rochester Rose. For the early market a good potato is the Early Ohio. It is a very early variety and will probably produce a greater number of marketable potatoes earlier than any other.

*By Mr. Erb :*

Q. Is the American Wonder an early potato ?

A. No, it is not an early potato, it is a medium too late ; one would call it late.

*By Mr. Bell : (Pictou.)*

Q. Is the Rochester Rose a variety ?

A. It is said to be a selection from the Early Rose ; it may be the Early Rose for all I know, because as I say there are many varieties which you cannot distinguish from each other, but it yields much better.

*By Mr. Rogers :*

Q. Is the Late Puritan a good potato ?

A. Yes, that has given good results at the farm.

Q. It is a pink potato ?

A. No, it is a white potato ; it looks somewhat like the American Wonder. I would like to incorporate, if the committee will consent, some results of the experiments at the farm. I have the particulars here.

*By Mr. Bell :*

Q. Do you know of any variety that resists rot when grown in heavy ground ?

A. No, I do not.



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Q. I remember in an English catalogue some years ago a variety recommended for that which I think was the Shumacher.

A. We tried it at the farm but it did not do well. I have here an English variety, the Holborn Abundance.

Q. You find old country potatoes do not do well?

A. As a rule, but this Holborn Abundance is an exception. It grows very well but it is not a good potato.

## PREVENTION OF SCAB—RECIPE.

*By Mr. Pettet:*

Q. Do you treat your seed for the scab?

A. Not at the farm, but I can give you the treatment for scab. Our land as any of you who have visited it know, is particularly adapted for potato growing, being a warm loamy soil. We have little trouble with the rot and practically no trouble with scab at all. I remember well the year when we applied the manure and had the scab as it was such an exception.

*By Mr. Hurley:*

Q. Was that rotted or green?

A. Green.

Q. Rotted won't have that effect?

A. No, not when incorporated with the soil. I may say that on the experimental fertilizer plots, barnyard manure has been applied at the rate of 15 tons per acre every year since 1889, and potatoes were grown on it every year except last year; but the manure is incorporated with the soil when harrowing and for this reason probably the potatoes did not scab as a rule. What I was speaking about was putting the manure right in the drill with the seed.

*By Mr. Rogers:*

Q. Have the different kinds of manure any effect upon potatoes, does one manure cause scab more than another?

A. In the different kinds of manure?

Q. Yes, for instance, it is said that hog manure is more liable to cause scab than the other?

A. I cannot speak from experience. There are two methods of treating seed potatoes to prevent scab:—

*Formalin.*—Soak the tubers for two hours in a solution of commercial formalin, 8 oz. in 15 galls. of water. This has proven to be a very good remedy indeed, and the formalin is an easy thing to handle.

*Corrosive sublimate.*—Soak the seed for one and one-half hours in a solution of corrosive sublimate, 2 oz. in 16 galls. of water, and cut the potatoes when they become dry. Corrosive sublimate is very poisonous and should be handled with care.

*By Mr. Bell:*

Q. How much formalin did you say?

A. Eight ounces in 16 gallons of water.

*By Mr. Semple:*

Q. Have you found, sometimes, that the potatoes when planted the first time give a good crop and the second not so good?

A. Yes, we have found that. While I never figured out what percentage of the new varieties yielded better the first year, some of them did and some of them did not, but I do not think there is a large percentage which yields well the first year and not very well afterwards. But I believe that, occasionally, a change of seed is a good thing. In our experimental farm work we select the best potatoes every year and we find our potatoes are increasing in yield rather than diminishing. Of the old varieties, the Early Rose of which we have been selecting the best tubers every year, still yields well though not as well as some others.

Q. Is that what you call the Rochester Rose?

A. No, this is the Early Rose, but the Rochester Rose is very much like it.

*By Mr. Semple :*

Q. Have you the Late Rose?

A. We have tried it, but it is not as good as some other varieties.

*By Mr. Rogers :*

Q. Will you tell us what the varieties are?

A. Everett, Carmen No. 1, Rochester Rose, Empire State and American Wonder.

*By the Chairman :*

Q. In applying the manure, for how long did you say it was applied?

A. Since 1889.

Q. What time did you put the manure on the land?

A. When the land was being worked in the spring. You will find all the results from the various plots in the report of the Director who has charge of these experiments.

#### CULTIVATION OF SOIL AND VARIETIES OF POTATOES.

With regard to drilling the potatoes, we make the drills two and a half feet apart and drop the sets one foot apart in the drill. As was said before experiments of different kinds have been tried and we find this is the most economical method. By having the rows this distance apart there will be an economy of the land and the ground will be shaded sooner so that the potatoes are not so liable to injury by drought as when they are farther apart.

*By Mr. Pettet :*

Q. Would you advise that plan where you have lots of land?

A. Yes, for the reason I will give you presently. After the potatoes are planted they are covered by a double mold-board plough by running it between the rows. The land is let lie that way for a few days until the weeds start, when the smoothing harrow is run over it, which kills, practically, all the weeds that have started to grow. Very often there is not time for two harrowings of this kind before the potatoes come up, but where it can be done much labour will be saved in hoeing later in the season and better crops will be obtained, because the production of a good crop much depends upon the labour that is put on the land. The later potatoes are planted the sooner they come up, and the less time you have in which to harrow, but the more one harrows the land before they come up, the better. That is where I think a great many farmers make a mistake. They omit this harrowing and the result often is that their land is very weedy in the fall. It is quite a common occurrence to find that farmers neglect this and in the autumn one cannot see the potatoes for weeds. If this harrowing that I speak of, before the potatoes are up or just as they are coming up, were adopted, you would see more potatoes than weeds, and the crop of the former would be greater. By the time the

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potatoes are up the land is nearly level and after this we cultivate. I believe it is wise to cultivate deeply the first time. The potatoes, as previously stated, are about 4 or 5 inches below the level of the ground, and by cultivating deeply the first time the soil is loosened down to the level of the potatoes or almost to that depth. Then, afterwards cultivation should be quite shallow, as the roots of the potatoes ought not to be disturbed. This is where the difference in cultivation comes in between that adopted at the Experimental Farm and that which is followed by many farmers. We adopt the level cultivation for several reasons. It has been found that in hilling up land such as we have on the farm, of course on heavier land it may be different, it is apt to dry out badly when dry winds prevail. Then, when the rain does come, if potatoes are hilled up, a great deal of it runs down the furrows and off the land. Our object is to keep the soil just as level as it possibly can be, and as loose as possible and the result is that almost all the rain that comes down goes into the soil, and by having the rows only two feet and a-half apart the plants soon cover the ground all over and the rain does not evaporate between the rows as quickly as it would if the soil were bare between them.

Some farmers may make the objection that by level cultivation there will be more sun-burnt potatoes, but we have not found this to be the case. We find that where the sets have been planted from 4 to 5 inches deep, there are very few sun-burnt potatoes. I believe one will get as much, or a much larger, proportion of sun-burnt potatoes, sometimes by hilling up, than he will by level cultivation, because the tubers push out and get outside of the hill, whereas when they are all several inches below the surface of the ground, they cannot do this, and by planting the sets as close as 12 inches apart there are not a great many potatoes in each hill and they are not crowded out of the ground, so we have them all underneath.

We have tried experiments in planting potatoes at different depths, and for the past two years have had the best results from planting the sets only one inch deep but I would not recommend that because the best average results are from planting 4 to 5 inches deep. The reason why we have had the best results from planting one inch deep is that there was plenty of moisture just at the time when the potatoes needed it, and I believe if one could regulate the season one would have a better crop of potatoes, by having them one or two inches deep. The reason being that in the wild state the potato grows on the surface or just barely underneath the surface of the soil. They seem to prefer the warmth that is to be found near the surface; and it is surprising how near the surface potatoes can be grown, if level cultivation is adopted, and yet not have many sunburnt or green potatoes. If potatoes were planted shallow, however, the harrowing, after planting, could not well be done: but a Breed's Weeder would work all right. However, shallow planting is not recommended by us.

A short time ago I started some potatoes in pots at the farm just to illustrate the growth of the tubers and roots. You see this plant which I hold in my hand, the potato was planted only one inch deep in a pot in a greenhouse. It has a better crop of potatoes and is further advanced than any of the others. This one was planted four inches deep and the other about three inches from the bottom of the pot and the pot filled up as the plant grew.

*By Mr. Hurley :*

**Q.** Are they all the one variety?

**A.** They are all the one variety. These potatoes came up in the pots on the 12th March. My object in showing these is to illustrate the development of the tubers. You see how important it is to have the ground thoroughly loosened. These are the feeding roots; they grow to a great depth, being fully a foot long now.

**Q.** Were they straight in the ground or spread out?

**A.** Well, the soil was just full of them, but if you take a potato plant up in the summer you will find its roots will go down twelve inches, if your ground is loose enough. As was said before, I believe that if one could regulate the season the shallower he plants, provided his potatoes do not get sunburnt, the better crop he



will have, but as the amount of moisture available cannot be controlled altogether, four or five inches is the best depth because you can regulate the moisture better.

*By Mr. Rogers :*

Q. You could not harrow when potatoes are planted one inch deep ?

A. No. The harrowing would root up the sets and if you planted them as shallow as that you would have to adopt a different method of killing the weed.

*By Mr. Hurley :*

Q. What would you do if you didn't harrow them ?

A. We should have to do more cultivating and hoeing. If one can get his land harrowed, much labour will be saved.

To show the wonderful difference in the yield of varieties, I might say that of the 143 kinds planted on the farm in 1899, the heaviest yield was obtained from the American Wonder, which produced at the rate of 640 bushels 12 pounds to the acre, while the poorest yielder, the Houlton Rose, produced 204 bushels 36 pounds, a difference of 436 bushels 36 pounds per acre in favour of the American Wonder, so you see it is very important for the farmer to get the best yielding varieties he can. As was said before, the farmer could not often get a yield like that on a large area, but there is no reason why he should not double or treble his crop, if he puts the labour on his land, and if a farmer is going in for selling potatoes he should put all the labour possible on his crop. If one only gets from 80 bushels to 115 bushels to the acre one does not make much out of raising potatoes for sale."

*By Mr. Rogers :*

Q. Is the American Wonder a good eating potato ?

A. Yes.

*By Mr. Hurley :*

Q. We raised over 150 bushels of that variety on half an acre last year.

A. It was more than most of your neighbours did ?

Q. There were none of the American Wonder around.

A. But that was a better yield than most of the people around you had ?

Q. Better than any of the others around.

A. Referring again to cultivation, it has been proven that, as a rule, the oftener potatoes are cultivated the better the crop will be. Cultivation should be continued until the cultivator cannot be got through without injury to the vines. After the potatoes are covered we start cultivating, the first cultivation being deep and the after cultivations shallow. Our object is to keep the surface of the soil loose until the tops meet between the rows. They have been trying some experiments at Cornell in this regard, and find that six cultivations will give better and more paying results than a less number. On the farm here there is, I believe, perfect potato soil, and from three to four cultivations is all that can be given them before the tops meet.

#### SPRAYING POTATOES.

With regard to fighting the potato beetle or Colorado potato beetle, which as you know, never fails to attack the crop, now, it is wise to watch out for them, and not wait until you notice the ravages they are making on the potatoes. It is not unfrequently the case that the other work of the farm puts this out of one's mind and the potato beetles are not attended to until their being there is noticed on account of the appearance of the leaves. This is too late to look after them properly because by the time the poison takes effect the tops will be much lessened, and the tops being, as it were, the lungs of the potato, the more they are eaten off the more the crop will be lessened.

## APPENDIX No. 1

Prof. Zavitz, of the Ontario Agricultural College, Guelph, tried a very interesting experiment at the farm there, which I shall like to mention here, by which he showed the great advantage of spraying. I might say, that we have found that putting the paris green on wet has given us the best results. One reason being that it can be applied with the Bordeaux mixture if this method is adopted. We have tried the knapsack sprayer, the barrel pump with the potato-spraying attachment, and the home-made machine with the barrel and hose, and other things as well. The home-made machine does very good work, but it wastes a good deal of material because the spray is not fine enough. There is no pump and the spray comes out by force of gravitation.

## VALUE OF SPRAYING AND HOW BEST TO DO IT.

I believe it will pay to spray the potatoes carefully, and to spray each individual plant. I believe the best method is to have a barrel pump in a cart and then to have a man or boy or two men or boys behind handling the nozzles and spraying the plants thoroughly. If the spraying is done automatically by means of nozzles fixed on a cart, the vines in some cases may not be covered or a nozzle may clog up and part of a row be missed altogether. It is a very busy time of the year when the beetles are at their worst, being haying time and the point is to kill the bugs with as little labour as possible, and to spray as seldom as possible so that it pays to give a thorough application the first time. The experiments of Mr. Zavitz, already referred to show conclusively how much is lost by not killing the beetles. It was found the yield per acre from vines sprayed for an average of two years was 138·20 bushels, and the yield per acre, unsprayed, averaged for two years 60·69 bushels per acre, a difference in favour of spraying of 77·51 bushels. Of course no one allows the potato bugs to go altogether, but the longer one leaves them unkilld the more the tops are eaten and the less crops one will get.

The CHAIRMAN.—I might mention the case of a neighbour of mine. His chickens kept all the bugs off the plants close to the barn and in the back end of the field furthest from the barn the bugs took the leaves pretty well off. The potato rot came and strange to tell where the bugs had taken the leaves off the potatoes were all safe, and where the leaves were on the potatoes were all rotted, showing conclusively that it is in the leaves the disease begins.

We have found it pays also to use Bordeaux mixture. It does not pay perhaps as well at the experimental farm as in other places because we are not much troubled with rot. But it will keep our potatoes growing about two weeks longer than if they were not sprayed.

*By an Hon. Member :*

Q. The Bordeaux is mixed with the paris green ?

A. Yes, and this saves spraying for the beetles separately. They have been carrying on experiments with Bordeaux mixture to prevent blight at the Vermont experimental station for eight years, and these are the averages for that time.

Sprayed potatoes yielded an average of 296 bushels to the acre, for eight years.

The unsprayed yielded 173 bushels to the acre, a difference of 123 bushels to the acre in favour of spraying with Bordeaux mixture.

In 1893 they had more surprising results than these. The potatoes sprayed gave 375 bushels marketable tubers to the acre, the unsprayed, 121 bushels to the acre, a difference of 251 bushels to the acre in favour of the sprayed potatoes.

To show you why these results are so striking, I may say that in another experiment which was tried at the same station it was found that on September 1 potatoes which were dug at that time averaged 234 bushels to the acre. On September 22 the same variety and the same sized plots were dug and gave 353 bushels to the acre, there being a gain in the twenty-one days of 129 bushels to the acre. That was the difference in the growth of potatoes made in that part of the summer. If potatoes can be kept growing that time what a difference in yield might be

obtained if spraying were practised by every one growing potatoes. There is no necessity for the potatoe ripening up at the time it does. As you all know a plant will ripen after it has produced seed. The potato does not produce seed now and if you can take it past the critical stage when ordinarily it would produce seed, you can keep it growing for a good deal longer, and as you know there is always a large proportion of small potatoes no matter when you dig your crop, the longer you can keep the plants growing the better results you will get.

*By an hon. Member :*

Q. Do you make only one application ?

A. At least three applications. The potatoes must be kept covered with this Bordeaux mixture. The vines should look blue from about the middle of July until the end of August, after which it takes some time for the spray to wash off and by then it will be nearly time to dig the potatoes.

*By Mr. Erb :*

Q. Will the mixture prevent the potatoes from being frozen ?

A. No.

Q. With us as a rule they freeze by September 15.

A. Yes, you cannot get potatoes to grow much after September 15. In the vicinity of Ottawa vines not sprayed usually die about the last week in August.

With regard to the digging of potatoes, there are a great many potato diggers on the market but few are perfectly satisfactory. We have found that a very simple arrangement at the Farm gives very satisfactory results. It looks something like a large pitchfork lying horizontally behind the plough and when the plough goes under the potatoes the soil sifts through and the potatoes are left behind and on top of it. Then if the land is harrowed pretty nearly all the potatoes are obtained.

*By Mr. Gilmour :*

Q. What quantity of Bordeaux mixture do you use ?

A. The mixture is a little stronger than what is used for apple trees, being six pounds of blue stone, four of lime, forty gallons of water, adding eight ounces of paris green for the Colorado potato beetle. Four ounces of paris green will probably kill the potato beetles, if you can spray them just after they are hatched, but the bigger they get the more it takes. It is better to be sure of having enough paris green to kill the beetles because every day one lets his potatoes go without having them killed, he loses a good many leaves off his vines.

*By the Chairman :*

Q. You spoke in the first place of not ploughing in the fall, but in the spring of the year. Yours is a light land but if you had a heavy clay would you plough in the spring ?

A. No, I would plough in the fall leaving the soil exposed in the winter to be pulverized by frost. If we plough our light soil in autumn for potatoes we should have a great deal of leaching, but by leaving the cover crop until spring where it can utilize all the plant food available in the autumn, there is plenty of time to get the soil into perfect condition, between ploughing time and the time for planting potatoes.



APPENDIX No. 1

FIVE YEARS' EXPERIENCE WITH VARIETIES OF POTATOES.

The following tables, taken from Bulletin No. 34, prepared by Dr. Wm. Saunders, give the average results of five years' tests of varieties of potatoes at the different experimental farms in Canada.

The twelve varieties of potatoes which have averaged the heaviest crops at the several experimental farms during the past five years are the following. (A few of the varieties which have been only four years under trial are so marked.)

CENTRAL EXPERIMENTAL FARM, OTTAWA, ONT.

	Per acre.			Per acre.	
	Bush.	Lbs.		Bush.	Lbs.
1. Holborn Abundance.....	414	55	7. Carman No. 1.....	343	50
2. Hmerican Wonder.....	396	39	8. Early White Prize.....	342	3
3. Late Puritan.....	369	6	9. State of Maine.....	338	41
4. Everett.....	364	45	10. Early Norther.....	338	20
5. Empire State.....	349	56	11. Seatie, 4 yrs.....	336	26
6. Seedling No. 230, 4 yrs.....	349	48	12. Rochester Rose.....	335	48

An average crop of 356 bushels 41 lbs. per acre.

EXPERIMENTAL FARM FOR THE MARITIME PROVINCES, NAPPAN, N.S.

	Per acre.			Per acre.	
	Bush.	Lbs.		Bush.	Lbs.
1. Seedling No. 230, 4 yrs.....	463	84	7. Pearce's Prize Winner.....	370	22
2. Irish Daisy.....	401	59	8. I. X. L.....	366	30
3. Holborn Abundance.....	398	52	9. Great Divide.....	362	47
4. Reading Giant.....	393	4	10. Vanier.....	353	33
5. Carman No. 1.....	391	27	11. Clarke's No. 1.....	357	25
6. Pride of the Market.....	378	20	12. Dreer's Standard.....	353	29

An average crop of 383 bushels 6 lbs. per acre.

EXPERIMENTAL FARM FOR MANITOBA, BRANDON, MAN.

	Per acre.			Per acre.	
	Bush.	Lbs.		Bush.	Lbs.
1. Irish Daisy.....	411	35	7. Chicago Market.....	378	35
2. Pearce's Prize Winner.....	387	45	8. Carman No. 1.....	375	28
3. Delaware.....	385	55	9. Great Divide.....	372	32
4. Late Puritan.....	385	44	10. Clarke's No. 1.....	370	20
5. Dreer's Standard.....	383	32	11. Empire State.....	369	25
6. Early Norther, 4 yrs.....	380	25	12. State of Maine.....	367	2

An average crop of 380 bushels 41 lbs. per acre.

EXPERIMENTAL FARM FOR THE NORTH-WEST TERRITORIES, INDIAN HEAD, N.W.T.

	Per acre.			Per acre.	
	Bush.	Lbs.		Bush.	Lbs.
1. American Giant.....	428	18	7. New Variety No. 1.....	366	1
2. Lee's Favourite.....	403	36	8. Northern Spy.....	365	43
3. American Wonder.....	389	4	9. Seedling No. 230, 4 yrs.....	362	58
4. Lizzie's Pride.....	368	48	10. Early Sunrise.....	360	30
5. Rochester Rose.....	368	22	11. Early White Prize.....	360	22
6. Brownell's Winner.....	367	..	12. Late Puritan.....	349	25

An average crop of 374 bushels 10 lbs. per acre.

	Per acre.			Per acre.	
	Bush.	Lbs.		Bush.	Lbs.
1. Dakota Red.....	383	52	7. Troy Seedling.....	346	22
2. Clay Rose.....	376	42	8. New Variety No. 1.....	343	34
3. Brownell's Winner.....	372	10	9. Lee's Favourite.....	337	26
4. Seedling No. 230, 4 yrs.....	367	45	10. Late Puritan.....	336	6
5. Irish Daisy.....	362	4	11. Empire State.....	325	..
6. Reading Giant.....	354	36	12. Rural Blush.....	322	..

An average crop of 352 bushels 18 lbs. per acre.

The twelve varieties of potatoes which have produced the largest crops, taking the average of the results obtained on all the experimental farms for the past five years, are :—

	Per acre.			Per acre.	
	Bush.	Lbs.		Bush.	Lbs.
1. Seedling No. 230, 4 yrs. ....	368	58	7. Carman No. 1. ....	389	59
2. Irish Daisy. ....	365	45	8. State of Maine. ....	386	23
3. American Giant. ....	364	15	9. Clarke's No. 1. ....	335	14
4. American Wonder. ....	359	57	10. Clay Rose. ....	334	21
5. Late Puritan. ....	349	59	11. New Variety No. 1. ....	333	48
6. Empire State. ....	345	46	12. Dreer's Standard. ....	333	45

An average crop of 347 bushels 21 lbs. per acre.

*By Mr. Erb :*

Q. I would like to ask the Chairman what variety of chickens he has that eats potato bugs?

A. Any of them will eat them if you keep them close on the patch.



Having read over the preceding transcript of my evidence, I find it correct.

W. T. MACOUN,  
*Horticulturist, Central Experimental Farm, Ottawa.*

## DAIRYING IN CANADA

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
TUESDAY, June 26, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. McMillan, Chairman, presiding.

Professor JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying, was present at the request of the Committee, and made the following statement:—

MR. CHAIRMAN AND GENTLEMEN,—I am very glad to have the opportunity this session of laying before the Committee on Agriculture and Colonization a brief statement of some of the work that is being carried on in the Commissioner's Branch of the Department of Agriculture. As the time is too limited for all the matters that I might lay before the Committee, I shall refer to the progress in five of the main divisions in the Commissioner's Branch of the Department of Agriculture. These comprise (1) the work at the government dairy stations in the different parts of Canada; (2) the experiments in the curing of cheese; (3) the cold storage arrangements in Canada; (4) what we have done recently in the fattening and shipping of chickens to Great Britain—the beginning of a new and, I hope, very profitable and large industry; and (5) some of the results from trial shipments of tender fruits to Great Britain. If time permitted and if I had been able to be at home, each of these subjects might properly have taken a whole session of the Committee.

### DOMINION DAIRY STATIONS.

The Dominion dairy stations were started in 1891, and had three objects in view: (1) was to begin and extend a new branch of dairying in places where it was not known, in the making of butter during the winter months in places where cheese was made during the summer time, and to promote winter dairying generally; (2) to introduce co-operative dairying in those parts of the country where creameries and cheese factories were not established; and (3) to bring about the best methods of manufacturing dairy products in all the provinces, and by that means to establish a reputation for uniformly fine Canadian cheese and butter, and to improve the quality of cheese and butter over the whole country. We have made a great deal of progress in each of these directions.

### WINTER DAIRYING.

I will mention first of all the progress made in winter dairying. There was no winter dairying in creameries in Canada before 1891; but by means of these government stations this business has been extended so much that during the last winter there were over 150 successful co-operative creameries in operation in Canada, making butter for home consumption and also for export to Great Britain.



## CO-OPERATIVE DAIRING.

With regard to the second object aimed at—to introduce co-operative dairying in places where it was not known—much has also been accomplished. That is shown by the fact that while in the maritime provinces in 1891 there were 28 creameries and cheese factories in operation, last year—1899—there were 177 in successful operation. A striking instance of the progress made is from the cheese factory started by this Department at New Perth, in Prince Edward Island, where the value of the output was a little over \$6,000 in 1892; you will remember that the Department continued to manage other cheese factories and creameries which were established in Prince Edward Island for some years, and then left them to be managed by the co-operative associations of farmers themselves. Last year it is reported there were 34 successful cheese factories in operation, with an output of the value of \$376,000, and 30 creameries with a total output worth \$140,000, making an output for the year of over \$516,000 in the Island from the cheese factories and creameries alone.

The cheese and butter from Prince Edward Island, I found in England, have taken a remarkably high place as a provincial product. In passing, let me say also that the increase in the whole Dominion during that period, between 1891 and 1899, in the number of creameries and cheese factories has been from 1,733 in 1891 to 3,649 in 1899. The increase in the various provinces has been as follows:—

	1891.	1899.	
Maritime provinces.....	28	177	Cheese factories and creameries.
Ontario.....	938	1,469	" "
Quebec.....	728	1,596	" "
" (combined butter and cheese).....		307	" "
Manitoba.....	31	64	" "
North-west Territories.....	7	32	" "
British Columbia.....	1	4	" "

This shows that the beginnings are laid for the carrying on of a large number of creameries in the North-west Territories, where the Department is doing nearly the whole of what it is doing in that class of work now. In October 1896 I had authority to announce that \$15,000 was granted to promote the establishment and maintenance of creameries in the North-west Territories. The object was to give the farmers who had not much chance of making a success of creamery work by themselves, under the conditions of isolation and distance from market which existed, a chance to enter into co-operation with the Department with that object in view. The conditions which were required by the Department were (a) that the farmers should form an incorporated association, (b) that they should provide buildings, premises and a water supply, and (c) guarantee the milk or cream of 400 cows. The Department on its part undertook (1) to provide machinery for the equipment of the building, (2) to manufacture and market the butter for the farmers at a charge of four cents per pound, (3) to make advance payments on account; (4) to pay rent for the building; and (5) to charge one cent per pound of butter for a loan fund to repay the loan from the Department for equipment.

The following is a summary of the work done:—

## APPENDIX No. 1

## SUMMARY OF BUSINESS IN THE N.W.T. AT GOVERNMENT CREAMERIES.

(Seasons are from May 1 to October 31.)

Year.	Number of Creameries.	Number of tributary Stations.	Number of Patrons.	Pounds of butter manufactured.	Average price realized at the Creamery.	Gross value of Product.
					Cts. per lb.	\$ cts.
1894.....	1	.....	56	23,727	15·39	3,653 54
1895.....	1	.....	60	53,249	20·51	10,923 37
1896.....	3	.....	211	132,021	18·54	24,526 43
1897.....	16	16	1,148	473,903	17·99	85,264 15
1898.....	19	15	1,051	484,984	19·32	93,740 67
1899.....	20	22	1,072	501,907	20·61	103,492 32

In 1894 we had just one creamery in the North-west Territories under the control of the Department. It was successful and pleased the farmers. In 1895 we had the same creamery. In 1896 we had three creameries. In 1897 sixteen creameries and sixteen tributary stations. In 1898 nineteen creameries and fifteen tributary stations. In 1899 we had twenty creameries and twenty-two tributary stations. The quantity of butter made under the care of the Department there has risen, from 23,727 pounds in 1894, to over half a million pounds last year; and the butter last year sold on the average for 20·6 cents a pound at the creameries, between the first of May and the end of October, which is the part of the season when butter is lowest in price.

*By Mr. Sproule :*

Q. What do you mean by 'tributary stations'?

A. Places where we have only the facilities for skimming milk or collecting cream.

*By Mr. Wilson :*

Q. Is this in the North-west only?

A. In the North-west only. The Dominion Government has now only two dairy stations elsewhere. These creameries are patronized by 1,072 farmers; and I find a general expression of satisfaction among these farmers, notwithstanding the difficulties of administering a business like that in detail by any Government department.

*By Mr. Clancy :*

Q. Three years was the limit for which they were to be supported?

A. That was the original intimation, that they should be managed and maintained for at least three years. This is the fourth year for some of them, because the farmers last year passed resolutions at their meetings setting forth that they had not yet had sufficient experience to conduct the creameries themselves, and that they were willing to pay 4 cents a pound of butter to the Department for doing so. In two of the large creameries, the 4 cents per pound more than met the expenditure for maintenance; but in the others the difference was made up by the Department

*By Mr. Wilson :*

Q. The difference is very slight I suppose?

A. In some cases slight, but in one we had five tributary stations, because it serves an extent of country over 25 miles distant from the creamery. In a few such cases, the net cost to the Department was about \$1,000 last year.

Q. How often do they get the cream to the creamery?

A. Three times a week from some points.

Q. That is pretty expensive?

A. Yes, but it is the only way of getting it.

*By Mr. Featherston :*

Q. I should think travelling that distance would almost churn the cream?

A. No, we make very good butter.

*By Mr. Wilson :*

Q. Is it taken on ice?

A. It is cooled before it is put on the cream waggons at the separating stations, and cream collecting stations. Some of it is not in the very best condition, but it is fit to make butter such as is superior to any that goes into British Columbia from any other place.

Q. Can you tell us the longest haul?

A. We have one where the cream comes not less than forty miles. It comes in two stages; one team brings it to the meeting point, and then the main cream wagon takes it to the creamery. The main value of these creameries is that in some sections the new settlers cannot ordinarily get any cash revenue at first from crops, but by having cows, they can get some cash every month from the creamery, and that tides them over the period of greatest difficulty. I think the Committee will not blame us for this—that, in a few cases, the cost of manufacturing has been almost 9 cents a pound for the butter—when it is considered that it gives the people a chance to make a living in starting in a new settlement, and afterwards the expense per pound goes down. The creameries provide not only a regular, although small, revenue to the new settlers, but they give the people hope and confidence in the future of the district.

*By Mr. Featherston :*

Q. Where the people have cows, it costs nothing to feed them?

A. Practically nothing in summer.

*By Mr. Wilson :*

Q. In the few that are now expensive, do you think they can do it for less later on?

A. Yes; and they can do it in some places now for under 4 cents per pound. Tindastoll was quite costly at first, as it was only a tributary station. This year they have a fully equipped creamery there. Last winter it was in operation and and turned out over 10,000 pounds of butter between November 1 and April 30. It was some twenty miles from the creamery, but now they have enough cows and milk to support a good station, and I expect they will be able to have a successful creamery, managed economically and profitably by themselves after a time.

*By Mr. Featherston :*

Q. How far were they from the railway?

A. About fifteen miles in a direct line.



## APPENDIX No. 1

*By Mr. Clancy :*

Q. Have all of these creameries come up to your expectation in the matter of repayments?

A. No; the repayments through the loan fund are not quite what we expected, because the quantity of butter made was not large at some of them. The loans to all of these creameries together were \$45,194.68 to these twenty creameries and twenty-two separating or collecting stations. Of that sum, \$19,531.14 had been credited through the loan fund or otherwise.

Q. Separating stations are merely subsidiary; they are part really of the creamery?

A. Yes; in most cases. In other cases, they are owned by a separate association of farmers.

Q. That was to have been all paid in four years, but \$25,000 was not paid, and it is due at the expiration of the time given?

A. Yes; some of it is past due; but, of course, the Government has a lien on the property. It is not all past due, because there was \$15,000 only voted the first year.

Q. I understand that there are some of them that can hardly hope to recover and repay?

A. I think there are three.

Q. Not more than three?

A. I think not. These are in the wheat-growing and beef-ranching regions, and in one district the farmers prefer home butter-making. If they don't repay, in nearly every case the Government owns the plant and can take it away and use it for another station or sell it. There is not a likelihood of much loss.

Q. What is the amount of loan involved in those three to which you made reference?

A. \$2,365.53 at one, \$1,215.82 at another, \$2,968.61 at the other, are the balances due. I think part of them will be repaid.

Q. Are there not some for very much larger sums than that in debt?

Q. Innisfail has a debt altogether of \$3,745.97, but Innisfail has four tributary stations, so that the loan is for five places.

*By Mr. Featherston :*

Q. But it does not show a loss of more than seven per cent?

A. I would not call it a loss at all yet, because the creamery business has been run now for three years, and has brought a revenue to these farmers for their butter of over \$100,000 for 1899. The loans are being gradually repaid at most places. In the meantime the farmers are getting more cows, the country is being developed, and the creamery business is being founded so that the farmers themselves can carry it on. They are escaping the losses and difficulties that belong to starting a new business in a new district.

*By Mr. Clancy :*

Q. Do you propose extending this system further in the North-west?

A. There was no extension by loans last year, and I think the intention is to limit them to the creameries started before last year. We have had no vote for two sessions, and none has been applied for.

Q. Is it the policy of the Department to extend it?

A. As far as I know it has not been proposed; I don't know the intentions of the Department.

Q. But as commissioner you would know?

A. There is no vote asked for, and no intimation that there will be.

Winter dairying at these creameries in Alberta has also proved successful. We began butter making at two creameries in the winter of 1898-99; there was a turn-out of 42,446 pounds of butter between November 1 and the end of April; and we sold that for a little over 23 cents a pound at the creameries. Last year we had

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four creameries at work which turned out 52,018 pounds of butter, which was sold for just a fraction under 24 cents per pound at the creameries all winter.

*By Mr Wilson*

Q. How do you account for it being so high in that country?

A. We have a very good market in British Columbia; and besides we sent some to Japan and some shipments went to the Klondike. We sell only for cash and as far as possible to the wholesale merchants. We account to the farmers for what we receive, keeping a separate account for each creamery. I have a letter from the superintendent of the Alberta creameries in which he gives a report of the progress this season. He cites four creameries and says that in May they made 14,784 pounds of butter in 1899, and that they made 24,724 pounds this year—a very successful showing for this year. I think that a similar report can be made from the creameries over the North-west generally.

*By Mr. Clancy*

Q. I want to ask, of these different twenty creameries which you started, commencing in 1897, are there any of them now standing on their own feet, that the Government have abandoned supervision over; I understand that is the ultimate end, that they should care for themselves; have any reached that end?

A. Not yet, although at two creameries there was a surplus last year in the revenue from the manufacturing charge over all maintenance expenses. They are not prepared as well in regard to facilities for marketing as the Department; and they ask us to continue to manage the work for them.

Q. How long will that last?

A. I don't know; but I think it would be a good plan for the Department to manage all those creameries so long as we have to operate a number of them that are not large enough or strong enough to be conducted by the farmers themselves. A single creamery under farmers would not give as much satisfaction as the Government creameries.

Q. That is not the same as the policy in Prince Edward Island, where you let them run themselves?

A. Well, we began in Prince Edward Island in 1892; and drew out in 1896-97. In the North-west we have offered the directors of all the creameries this year that as soon as they feel like taking over the management, we will let them do so, and help them so far as we can.

Q. They are not likely to do that so long as there is a good paternal government behind them?

A. But at the largest creameries, this costs the Government practically nothing, and we think it has given good satisfaction, and real beneficial service to the settlers in all the districts.

*By Mr. Dobell:*

Q. In the case of these creameries are the cattle fed on ensilage or on dry food?

A. They are fed on grass, but not on ensilage, because Indian corn, perhaps the only plant suitable for silo purposes, does not thrive there. In the Alberta region the cows run out part of the winter.

*By Mr. McMullen:*

Q. Is the butter from grass-fed cows as good there as it is in Ontario?

A. It is rather higher in colour and has more flavour.

*By Mr. Dobell:*

Q. Then I understand you to say that they are not making any silos in that country?

A. No, and I do not think they could use them.

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*By Mr. McLennan (Inverness):*

Q. What is the cost of an average separator?

A. The price of cream separators varies very much according to the capacity and make of the separator. An ordinary hand separator of small size can be got for about \$60; and a large power separator will cost \$300.

*By Mr. Sproule:*

Q. How much butter will one of the small separators turn out per hour?

A. I think they claim that they can separate 25 gallons, 250 pounds of milk per hour.

I have already mentioned the receipt of a report from Mr. Marker, the superintendent of creameries at Calgary, part of which I would like to read to the Committee. He says: 'It affords me much pleasure being able to report that the creamery work in the district of Alberta, as a whole, is in a flourishing condition. On account of the early spring the output of butter for May has shown a large increase as compared with the same month last year. This applies to all points except Edmonton district where, owing to frequent and heavy rains during May, the roads have been almost impassable. I attended a series of meetings throughout this division in the month of April, in order to learn the requirements, if possible, of the patrons at the various points.

'At Fort Saskatchewan I was strongly impressed with the desirability of having the cream, furnished by the farmers of the surrounding district, manufactured into butter at that point. Last year we had a great deal of trouble bringing the cream from the Fort into Edmonton over bad roads. The expense of hauling was very considerable too, the distance being about 25 miles. When the roads were soft an ordinary team could but haul a small load, which made it necessary to make more trips, and increased the expenditure. This year we have been assured of a very much larger patronage at the Fort, and I thought it advisable to arrange to have the butter made there. We rented a store in the town for \$10 per month and installed a small butter-making plant which we had on hand lying idle. The man whom we had last year in charge of the separating station is a butter maker and will attend to this work this year.

'At Wetaskiwin the output of butter during May was 3,400 pounds as compared with 1,477 pounds last year. A number of new patrons are coming in, and when the tributary stations at Boggy Plains and Leduc become properly started we look for a heavy make.

'At Red Deer the output for May this year was 8,481 pounds as against 4,471 pounds last year. The patrons are beginning to move in the direction of having a co-operative creamery established at the village, and are looking forward to your visit to having the necessary arrangements made.

'The creamery of Tindastoll is doing good work, too; in my letter of the 12th inst. I quoted some figures as to the quantity of butter manufactured there. The Swan Lake district has been made tributary to Tindastoll this year.

'Innisfail is leading in the matter of quantity, 9,500 pounds being made during the month of May as against 7,800 last May. No separating is being done this year, cream routes having been organized instead. This, I think, will be more satisfactory all around, and the financial statement for the season will be more in keeping with the amount of business done.

'The creamery at Calgary is also doing well, last month shows an output of 3,443 pounds of butter, as against 1,036 pounds for May, 1899. This increase is due in a great measure to the supply of cream from the northern tributary stations at Olds and Lacombe. As for the Calgary district proper, there is very little difference in the supply, it being quite small. Okotoks is doing nicely, though not as well as I had anticipated. Probably it will push ahead shortly.



'The Maple Creek district will not show a great deal of increase this season unless we secure a supply of cream from some other section. With this end in view I visited the settlement at Josephsburg, some thirty miles south-east of Medicine Hat, some little time since. While nothing could be done, definitely, at the time, I think perhaps we shall have some cream from there and ship by train to Maple Creek some time this summer. As you know, nothing is being done at Cardston this season.'

## IMPROVEMENT IN THE CURING OF CHEESE

I want now to make a statement regarding the work of trying to improve the methods of curing cheese in Canada. This is another branch of dairying where systematic and authoritative guidance will be very useful. In 1886, when the Governments first began to give systematized educational help to the dairymen of this country, the exports of cheese from Canada were 78,112,927 pounds, valued at \$6,754,626, whereas in last year (1899) we find that the exports of cheese were 189,827,839 pounds, worth \$16,776,765, showing a very decided growth. At least a large part of that growth was due to the systematic, well organized and well directed efforts of different agencies, not only of the Dominion government but of the provincial governments, dairymen's associations and boards of trade. During the period from 1886 to 1899, the British imports of cheese increased 34 per cent, whereas the Canadian exports increase 143 per cent. That indicates something of what may be gained by systematic, competent and authoritative direction, because the Government did not give any bonus assistance. Canadian cheese stands well, but it has not been sold as well or as high as the best English and Scotch home-made. I have looked into this matter carefully for years, and I find that the English and Scotch dairymen and cheese makers have made great improvements in their methods, and have learned from Canadians, methods of handling milk and the curd from it. But the main part of cheese making is in the curding of it, and here the English and Scotch have the advantage of us. They have a climate which gives them an average temperature in June, July and August of between 60° and 62° Fahr. That has given a flavour to their Cheddar and Cheshire cheese which they like, and it is not possible to please the English people unless you give them a cheese with a similar flavour. If we can make a climate like theirs inside our curing rooms in Canada, we could just hit the requirements of the English market.

That is the point that our cheese makers need to provide for,—an English climate in the curing rooms in Canada with conditions of temperature and moisture which will give to the cheese a cool mild flavour and the richness of body which command the highest prices.

The Department decided last year to carry on experiments at two factories. During the warm weather one-half the number of cheese from every vat were placed in an ordinary curing room, and the other half in each case were placed in an improved curing room where the temperature was controlled. In the controlled curing room the temperature was kept continuously under 65° Fahr., and in the other curing room the temperature sometimes rose to over 80° Fahr. I examined and compared all the different lots of cheese cured under the different conditions, but we thought it desirable to obtain also the opinions of some of those in the export cheese trade. We asked the Butter and Cheese Association of the Montreal Board of Trade to appoint a committee to examine those lots of cheese. The three or four cheese, as the case might be, from the controlled curing room were placed right opposite to the corresponding three or four from the uncontrolled curing room. The cheese had been kept in these curing rooms until they were about three weeks old, when they were shipped to a cold storage warehouse. They were kept in it at a temperature of about 38° Fahr. until they were examined.

The following is the report of the committee:—

'At a recent meeting of the Butter and Cheese Association, which was called at the request of the Dairy Commissioner, we, the undersigned, were appointed a committee to inspect several lots of cheese, half of which we were informed had been cured at a temperature of not exceeding 65°, the remainder being cured in the

ordinary curing room. In company with the Dairy Commissioner we inspected some thirty-one lots, and we found those cheese cured at a temperature of not exceeding 65° were very much superior in quality to those cured in the ordinary way, the difference in quality in most instances being most marked. Those cured at the lower temperature were better bodied, more silky in texture, and much milder in flavour, besides retaining their moisture better than those cured in the ordinary way. As a merchantable article we consider those cured at the lower temperature are worth fully one-half cent per pound more in price than those cured in the ordinary way. In view therefore of the marked superiority in quality shown in those cheese, that were cured at the lower temperature, we advise that the Government be urged to impress upon the cheese factories the desirability of seeing that their curing rooms are kept at a temperature of not exceeding 65° Fahr., and that the factory men should also be informed of the length of time required to cure cheese at the lower temperature. A detailed report is herewith annexed.

‘ARTHUR HODGSON, President.  
 ‘JNO. McKERGOW,  
 ‘D. A. McPHERSON,  
 ‘ALFRED J. BRICE,  
 ‘P. W. McLAGAN.’

That presents the substance of the whole question. The cheese cured under these conditions of controlled temperature, continuously under 65° Fahr., are of a better quality, better flavour and are worth a half a cent per pound more than the others cured in an ordinary curing room in which the temperature was sometimes between 70° and 80° Fahr.

*By Mr. Featherston:*

Q. What is the difference of temperature in the ordinary curing room?

A. It will go over 80° in the ordinary curing room in the heat of the day, sometimes 85°. In these controlled curing rooms the temperature need not rise above 65°.

*By Mr. Dobell:*

Q. Is not that a very small difference in the value, half a cent a pound?

A. One-half cent per pound on the total quantity of cheese exported last year would have been an increase of over \$900,000 to Canada.

Q. But the difference between the price of a first-class cured cheese in England, and a partially cured one, is very much more than that. You can get as high as a shilling or 14 pence a pound for a first-class cheese in England, while the ordinary cheese is only 8 pence or less.

A. The difference in the retail price is always very much greater than in the wholesale.

The June and July makes of cheese in England are the best and the highest priced of the season, as a rule. In Canada the largest make of cheese is in June, July and August; and if these cheese had a cool flavour similar to the September cheese, that would be of very great value to the trade. It would give us the best quality at the season when the production is greatest; and would represent a much greater gain than even the difference in the value per pound. It would greatly increase the consumption and demand for Canadian cheese.

*By Mr. Featherston:*

Q. Your values are based upon the market prices here?

A. Yes, the market price here. There was a difference between the shrinkage in weight of the cheese which were in the controlled room and the others. It was a little more than half a pound per box less in three weeks in the controlled room



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than in the other. That would be an appreciable saving on the whole output of a factory which turned out, say, 300 cheese per month. The saving in shrinkage on 900 cheese would amount to not less than 450 pounds; and an increased value of  $\frac{1}{2}$  cent per pound would come to over \$300. The cost of making the improvements to an ordinary factory of that capacity need not be more than \$200. The saving in the shrinkage of weight of the cheese and the increased value at half a cent per pound in such a factory for three months would be more than the whole cost of such improvements as I suggest.

*By Dr. Sproule :*

Q. Would the improvement made in one year be sufficient for the next year; are they permanent?

A. Yes, sir.

*By Mr. Dobell :*

Q. Could a room in an ordinary cold storage warehouse be prepared as a curing room if kept at the proper temperature?

A. Yes, but in the ordinary cold storage the temperature is too low to cure cheese.

Q. If you keep it at 55° or 60° that would do?

A. 60° to 65° Fahr. is better for the first few weeks. The improvements that are needed to the curing rooms, are that the construction of the walls, floors and ceilings shall be such that heat will not go through them readily. There should also be double doors and double windows. As a cheap and effective means of cooling, and at the same time ventilating a curing room, a sub-earth air duct may be brought in through the floor of the room in two places. It should be not less than 100 feet long, about 4 feet deep, and be made of tiles. Enough tiles should be put in to give it a capacity of about 100 square inches for the passage of air, per 5,000 cubic feet of curing room space. The rows of tiles should be laid about 2 inches apart. At the far or entrance end of the duct there should be an upright flue about 20 feet high. On top of that there should be a cowl with a wide spreading funnel mouth to catch the wind.

*By Mr. Wilson :*

Q. Is that all you would do?

A. We put in a supplementary ice rack for very warm days; but few factory men make that provision. A curing room constructed in this way, with insulated walls, double doors and windows and an efficient sub-earth duct, will be from 10 to 20 degrees cooler than an ordinary curing room.

*By Mr. Featherston :*

Q. I suppose in the ordinary shipping hold of an ocean vessel the temperature would be something near that, would it not?

A. Yes, and nearly all the cheese that now go through Montreal warehouses are cooled before they are put on the vessels. I discovered one thing that surprised me in this investigation. It seems to be contrary to all the notions we had before about the curing of cheese. It was that the cheese cured at the controlled lower temperature was cured considerably faster than those cured at the higher temperature. At the end of the first three weeks those in the controlled room were in a more advanced stage of curing than those that were cured at the higher temperature.

*By Mr. McMullen :*

Q. In establishing factories or dairies, whether would you recommend the establishment of factories especially for butter or for cheese, or a combination producing cheese part of the time and butter for the rest of the season?

A. I think for most districts a combined factory is the best, where they would make cheese during the warm weather and butter during the other parts of the year.

*By Mr. Featherston :*

Q. And you would not be making butter then at a time when butter is very low in price?

A. No. Butter is an article much more difficult to keep than cheese. If cheese can be made from about the middle of May to the end of October, and butter for the remainder of the year, that should give the best financial returns.

*By Mr. McMullen :*

Q. Is not the middle of May to the end of October the season that you want to feed calves, in order to make fat calves, and you want the milk back from the factory?

A. A good many farmers now are having some cows calved in the fall and some in the spring. In that way I think we are making considerable advancement towards better stock as well as a larger direct revenue from dairying.

*By Mr. Featherston :*

Q. No doubt you can raise calves better in the month of October, and on through the winter than in the summer?

A. In this climate a calf coming in October has a better chance to thrive than one born in May or later in summer.

*By Mr. Wilson :*

Q. About the flavouring of butter, you have entirely got over your difficulty, have you, in the use of the milk in summer for cheese and for butter in the fall?

A. By having a few cows fresh-calved and mixing their milk with the other, we have succeeded in getting a fine flavoured butter in autumn and winter.

Q. You still hold that view, that it is better to have fresh-calved cows for butter-making?

A. Yes, milk from some comparatively fresh-calved cows. The cream should be pasteurized; and a fermentation started should be used particularly in winter. Even the Danish dairymen try to have one-half of their herds calve between August and December; that is their regular practice.

*By Mr. Dobell :*

Q. Are there any factories where they devote themselves to making skim cheese like they do in Holland?

A. I think not. A request has come from one factory in Nova Scotia inquiring whether they might make skim milk cheese for the West India trade.

Q. You know a little experience we had in sending ordinary cheese to South Africa was that the cheese was not suited to the climate and spoiled. The black population there live largely on Dutch cheese, which are like cannon balls, and nearly as hard, so that you can send them through the country and there is no danger of them being injured by the heat.

A. One reason why we have been trying to prevent the manufacture of skim cheese in Canada has been, that a few years ago some American factories made skim cheese. It was charged that they sold them as full cream cheese. It was necessary in order to preserve our reputation for fine unadulterated cheese that there should be no suspicion as to its character, and therefore the making of skim cheese was discouraged. Now that Canadian cheese has made such a good reputation there would not be the same danger of suspicion, from the making of skim milk cheese for markets in hot climates. The law requires that all such should be properly branded 'Skim-milk Cheese.'

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Q. If you could make skim cheese here, you would not only make the profit out of it, but you would make a cheese that they would use in the West Indian and African markets.

A. Our cheese have such a reputation now that I think perhaps there is not so much danger as formerly that the making of skim cheese for that market would injure our trade.

*By Mr. Rogers :*

Q. Have you looked into this system of churning butter by means of air and using the residue for cheese?

A. I am afraid I have been bothered by looking into several different classes of fakes the last few years; and that is one of them.

*By Mr. Cargill :*

Q. One of these fakes is where they manufacture butter, and then cheese from the residue, and then champagne from what is left?

A. I had not heard of the last part of the delusion.



## FATTENING CHICKENS

Last year I described to the Committee our experiments in fattening chickens for the table and for export. Two experimental stations were established in order to carry on this work and to illustrate how the business can be made profitable. One was located at Carleton Place, Ont., and the other at Bondville, in Brome County, Quebec. The successful results obtained at Carleton Place during 1898 you will remember I gave the Committee last session, and I will now give you the results obtained at Bondville by Mr. A. P. Hillhouse. Two hundred birds, mostly of large breeds, were purchased from farmers in the neighbourhood and placed in coops on October 14, 1898. When cooped their average weight was  $3\frac{1}{2}$  pounds. Each coop was  $6\frac{1}{2}$  feet long by 16 inches inside, divided into three sections each containing five chickens. They were fed from a trough in front of the coops three times a day for the first three weeks. During the first week they consumed 450 pounds of grain and 1,000 pounds of skim-milk, and the gain in weight was  $173\frac{3}{4}$  pounds. During the second week they consumed 370 pounds of grain and 900 pounds of skim-milk, and gained 19 pounds in weight. The same amount of feed was consumed during the third week, making a gain of  $26\frac{1}{2}$  pounds. In the three weeks the chickens ate 1,190 pounds of grain and 2,800 pounds of skim milk, and made a total gain in weight of  $219\frac{1}{4}$  pounds. The small gain shown in the second and third weeks is caused by the fact that a portion of the feed was not ground fine enough. Had this been done the results would have been much more satisfactory.

During the next three weeks the cramming process was adopted, the chickens being fed from the machine twice a day. In the first week they consumed 485 pounds of grain and 700 pounds of skim-milk, with the addition of 14 pounds of beef tallow, and they gained in weight  $140\frac{1}{2}$  pounds. In the second week they got 475 pounds of grain, 700 pounds of skim-milk and 25 pounds of beef tallow, and showed a gain of 103 pounds. For six days in the third week they were given 450 pounds of grain and 600 pounds of skim-milk, without any tallow, and gained  $84\frac{1}{4}$  pounds in weight. For the 1,410 pounds of grain, 2,000 pounds of skim-milk and 39 pounds of tallow fed during the three weeks they showed a gain in weight of  $327\frac{3}{4}$  pounds.

After being starved for thirty-six hours, in order to free the crop and intestines from food, they were killed by dislocating the neck at the first joint close to the head. Plucking was begun at once while the fowl was warm, to avoid tearing the flesh. As soon as plucked they were put on shelves under a weight to keep them in good shape. When they were quite cold each fowl was neatly wrapped in paper and packed tightly, twelve in a case, and shipped to London, England.

It will be seen by this that at the end of the six weeks during which the chickens were systematically fed the total gain was 547 pounds, an average of  $2\frac{3}{4}$  pounds to each chicken. The food which they consumed cost \$32.95, an average of 6 cents per pound of increase in live weight. As it is the edible portion that increases most in weight, the fatted fowl is better value to the consumer at 12 cents a pound than the fowl fed in the ordinary way at 6 cents a pound. The fowls which were most easily fattened were two coops of high grade Plymouth Rocks, one coop of pure bred Wyandottes, one coop of pure bred Plymouth Rocks, and one coop of pure bred Light Brahmas.

At the two chicken fattening stations conducted in 1898 it was discovered that the cost for food consumed was a little over six cents per pound of increase in weight of live chickens. The food was ground oats and skim milk; and the gain per chicken was from  $1\frac{3}{4}$  to  $2\frac{1}{4}$  pounds in from four to five weeks' feeding. In our illustration work in the autumn and winter of 1899, we found that the information gained in 1898 was confirmed; but at some of the stations where the chickens were not of a large or table fowl breed, and where the grain was not ground very fine, the amount of food consumed was greater than the figures I have given; and the cost of feed per pound of increase was proportionately higher.

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We put up between one and two hundred chickens at each fattening place, and we had altogether eleven fattening places. Altogether we fattened and handled for shipment to England something over 3,000 chickens last year.

Q. Do you mean the Government had them?

A. Yes.

*By Mr. Clancy:*

Q. The figures you have given us as to the cost are exclusive of labour?

A. Altogether; that is the cost of the food alone.

*By Mr. Bell (Pictou):*

Q. How many pounds did you say they gained?

A. From  $1\frac{3}{4}$  to  $2\frac{1}{4}$ .

Q. In what time?

A. From four to five weeks.

*By an Hon. Member:*

Q. With the cramming machine?

A. It is profitable to use the cramming machine one week or a little longer only, at the finish of the fattening. If the Committee will allow me, I shall put in some notes that I have here, in which directions for the feeding are specifically given. If taken as evidence they would be useful in the report.

1. The crates in which the fattening is carried on are six and a half ( $6\frac{1}{2}$ ) feet long by sixteen (16) inches square, inside measurement. Each crate is divided into three compartments, and each compartment holds four or five chickens according to their size. The crates are made of slats running lengthwise on three sides and up and down in front. The slats may be from 1 inch to  $1\frac{1}{2}$  inches wide by  $\frac{5}{8}$  inch thick. The spaces between the slats in front should be 2 inches wide to permit the chickens to get their heads through for feeding. The slats on the bottom should be put on  $\frac{3}{4}$  of an inch apart. Each compartment has a small sliding door in front.

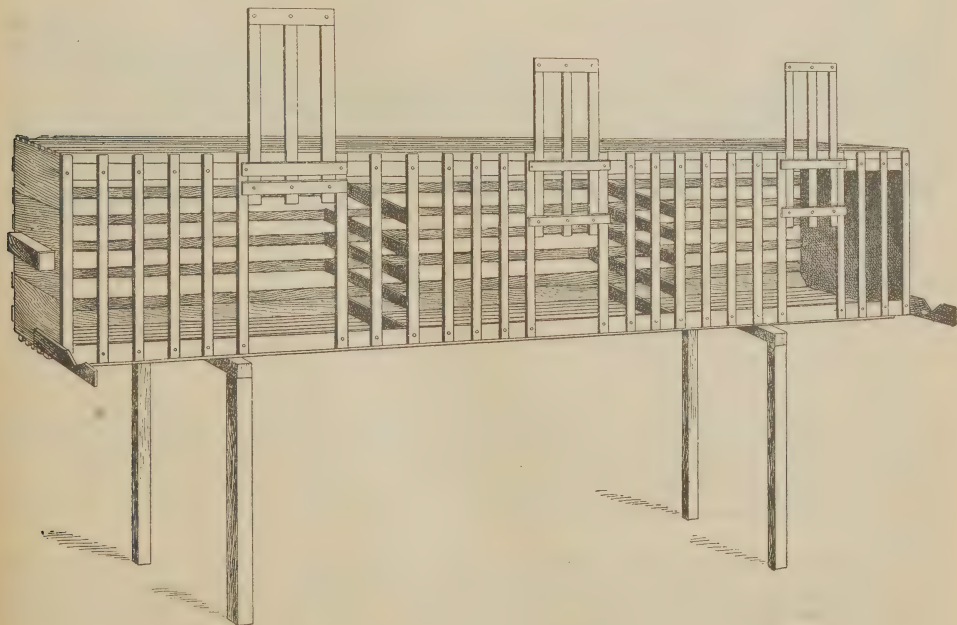


FIG. 1 shows a single crate or coop.

2. The crates are placed on stands about  $2\frac{1}{2}$  or 3 feet from the ground. The droppings from the chickens in the crates are received on sand or some absorbent material below.

3. A light "V" trough,  $2\frac{1}{2}$  inches inside, is placed inside of each crate running the whole length of it. The bottom of the trough is about level with the floor slats of the crate.

4. The birds of the larger breeds are best suited for fattening. Dorkings and Plymouth Rocks are good sorts, also light Brahmas and Buff Cochins or crosses of these. The age may be anywhere from three to four or even five months, and the condition of the bird should be such as to indicate healthfulness and a tendency to fatten.

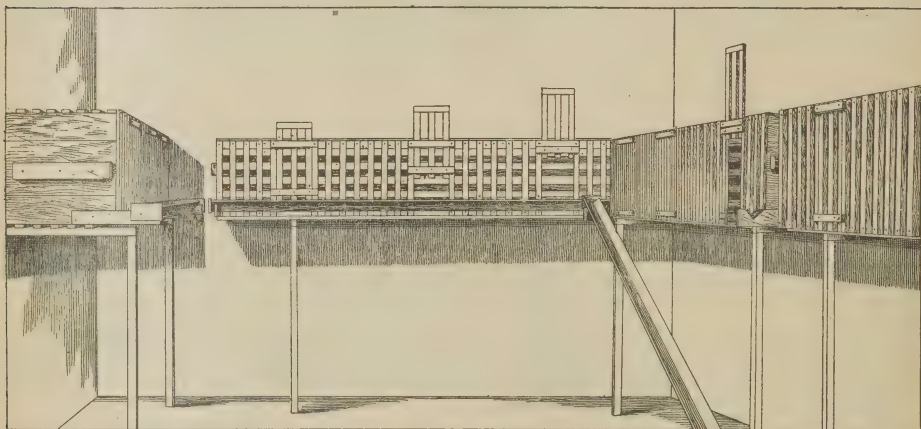
5. The feed may be oats, barley or wheat, preferably oats, ground very fine, as fine as they can be pulverized, the seeds or hulls being kept in and also thoroughly pulverized.

6. The ground grain should be mixed with skim milk only. The skim milk may be sweet or sour, preferably sour. The mixture should have about the consistency of thin porridge; so thick that it will not run readily and so thin that if a large spoonful of it were put on a plate it would spread.

7. The chickens should be fed from the trough in front of the crates three times a day. During the first three or four days they should be fed quite sparingly. After the first week they should be fed as much as they will eat up clean, twice a day. They should be given water twice a day and an allowance of grit twice a week. Ground oyster shells are suitable.

8. When the chickens are first put in, it is a good plan to rub a little sulphur close under both wings over a spot of about  $1\frac{1}{2}$  inches in size, and over a similar surface of the skin under the tail. That treatment will kill lice.

Figure 2 shows the arrangement of fattening-coops in a shed.



9. It is desirable to have the chickens fed in the crates from the troughs for about two weeks. They should be fed lightly for the first week, and after that, they may be fed as much as they will eat up clean, twice a day. Then they may be fed by the cramming machine. When it is used, they should be fed twice a day only, and the feeding period with the cramming machine should not be longer than two weeks.

10. During the last ten days of the fattening period a small portion of tallow should be put with the feed. To begin with, the tallow should be used at the rate of 1 pound per day for about 70 or 100 chickens, according to size. That should be gradually increased until 1 pound per day is being fed to from 50 to 70 chickens.



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The best way to mix the tallow is to melt a portion of it, thicken it while still hot with ground meal, and then mix the right quantity of that paste with the other feed for the day.

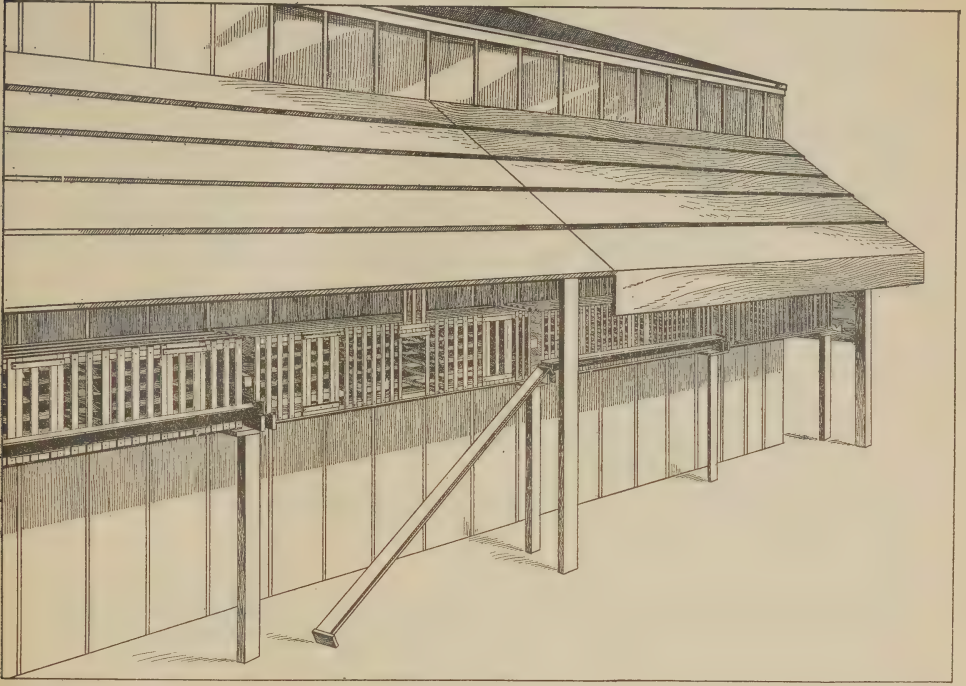


Figure 3 shows the arrangement of fattening coops beside a close high fence outside, with a rough board shelter against rain.

11. The cramming machine is a pail-like hopper, standing on three legs about  $4\frac{1}{2}$  feet high, with a small force-pump at the bottom leading to an opening, on which is placed a rubber tube about 10 inches long and  $\frac{3}{8}$  of an inch diameter inside. The rubber tube is about  $3\frac{1}{2}$  feet, or the height of the feeder's waist, from the ground. The feeder takes the bird by the legs and holds it against his body, partly under the right arm. He then opens its beak with his left hand and puts it over the rubber tube. The left hand carries the head forward, the neck of the bird being kept straight by drawing it slightly back by the right hand, which is around its body, with the fingers over its crop. The rubber tube, being wetted with milk, readily slides into the bird's crop. By pushing the pedal with the foot, a sufficient quantity of the feed is caused to pass into the crop. That is known by the hand which is over the crop. The pedal is let up, and all pressure of food into the crop is removed before the bird is pulled back. If that is not done, some of the food will be exuded into the throat and that might cause choking. The operation is quite simple, and does not seem to be in any way harmful or even disagreeable to the chickens.

STATEMENT of the First Lot of Chickens Fattened at Carleton Place, Ont.

(Season of 1899.)

120 Chickens.		Grain.	Skim Milk.	Gain in Weight.
		Lbs.	Lbs.	Lbs.
Feed and gain 1st week		175	220	93
" " 2nd "		220	260	27
" " 3rd "		245	290	129
" " 4th "		280	375	18
" " 5th "		375	430	16
Total feed and gain		1,295	1,575	283
Feed consumed per pound of gain in weight		4.5	5.5	

Number of chickens	120	
Cost	\$29.34	
Cost per chickens put in coops	23	cts.
Grain consumed	1,295	lbs.
Skim milk consumed	1,575	"
Total gain in weight	283	"
Gain in weight per chicken	2.2	"
Cost of feed per pound of gain*	6.5	cts.
Sold per pair in England	\$1.51	"

Sold by James Ruddin, Liverpool, at 7½ pence per pound.

STATEMENT of the Second Lot of Chickens Fattened at Carleton Place, Ont.

(Season of 1899.)

142 Chickens.		Grain.	Skim Milk.	Gain in Weight.
		Lbs.	Lbs.	Lbs.
Feed and gain, 1st week		200	320	86
" " 2nd "		285	370	82
" " 3rd "		305	398	119
" " 4th "		325	410	50
" " 5th "		320	430	20
" " 6th "		315	460	34
" " 7th "		280	370	*8
" " 8th "		170	190	18
Total feed and gain		2,200	2,948	401
Feed consumed per pound of gain in weight		5.3	7.2	

\* Loss.

Number of chickens	142	
Cost	\$42.63	
Cost per chicken put in coops	34	cts.
Gain in weight per chicken	2.8	lbs.
Cost of feed per pound of gain	8.0	cts.
Sold per pair in England	\$1.78	

Of this lot, 108 chickens sold by James Ruddin, Liverpool, as follows:—  
72 chickens at 7½ pence per pound.  
36 " 7 " " "

\* The ground grain was valued at \$1.25 per 100 lbs., and the skim-milk at 15 cents per 100 lbs. in all cases.

## APPENDIX No. 1

## STATEMENT of the First Lot of Chickens Fattened at Bondville, Que.

(Season of 1899.)

204 Chickens.	Ground Oats.	Skim Milk.	Gain in Weight.
	Lbs.	Lbs.	Lbs.
Food and gain, 1st week.....	435	545	86½
" " 2nd week.....	565	730	140½
" " 3rd week.....	660	845	153½
Total feed and gain.....	1,660	2,120	380½
Feed consumed per pound of gain in weight.....	4·36	5·57	.....

Number of chickens.....	204
Cost.....	\$47 00
Cost per chicken put in coops.....	23 cts.
Average gain in weight per chicken.....	1·8 lbs.
Cost of feed per pound of gain.....	6·4 cts.
Sold per pair in England.....	\$1 25

Sold by James Ruddin, Liverpool, 204 chickens at 7½ pence per pound.

## STATEMENT of the Second Lot of Chickens Fattened at Bondville, Que.

(Season of 1899.)

216 Chickens.	Ground Oats.	Skim Milk.	Gain in Weight.
	Lbs.	Lbs.	Lbs.
Feed and gain 1st week....	472	615	69
" " 2nd ".....	655	850	162
" " 3rd ".....	490	630	76½
" " 4th ".....	573	740	96
Total feed and gain.....	2,190	2,835	403½
Feed consumed per pound of gain in weight.....	4·42	7·03	.....

Number of chickens.....	216
Cost.....	\$51.28
Cost per chicken put in coops.....	24 cts.
Average gain per chicken.....	1·8 lbs.
Cost of feed per pound of gain.....	8 cts.
Sold per pair in England.....	\$1.02

Sold as follows: Sprigens & Sons, London, 110 chickens at 2 shillings and 2½ pence each. John Bailly & Son, London, 107 chickens at 2 shillings each.



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## STATEMENT of the First Lot of Chickens Fattened at Sussex, N.B.

(Season of 1899.)

208 Chickens.	Ground Oats.	Skim Milk.	Gain in Weight.
	Lbs.	Lbs.	Lbs.
Feed and gain 1st week.....	477	600	122
" " 2nd ".....	501	600	104
" " 3rd ".....	651	600	96
" " 4th ".....	640	600	84
" " 5th ".....	650	600	51
Total feed and gain.....	2,919	3,000	457
Feed consumed per pound of gain in weight.....	6.38	6.44	

Number of chickens.....	208
Cost.....	\$55.60
Cost per chicken, put in coops.....	27 cts.
Average grain in weight per chicken.....	2.2 lbs.
Cost of feed per pound of gain in weight.....	8.6 cts.

Part of this lot were condemned as being mouldy when they were delivered in London. It was learned afterwards that the agent of the steamship had permitted green lumber to be put in the cold storage chamber beside them.

## STATEMENT of the Second Lot of Chickens Fattened at Sussex, N.B.

(Season of 1899.)

200 Chickens.	Ground Oats.	Skim Milk.	Gain in Weight.
	Lbs.	Lbs.	Lbs.
Feed and gain 1st week.....	510	250	92
" " 2nd week.....	470	600	86
" " 3rd week.....	325	600	31
" " 4th week.....	300	250	53
Total feed and gain.....	1,605	1,700	262
Feed consumed per pound of grain in weight.....	6.12	6.54	

Number of chickens.....	200
Cost.....	\$51.55
Cost per chicken put in coops.....	26 cts.
Average gain per chicken.....	1.3 lb.
Cost of feed per pound of gain.....	8.6 cts.
Sold per pair in England.....	\$1.22

Of this lot, sold by R. Glendinning & Co., Liverpool:—186 chickens at 7½ pence per pound.

## APPENDIX No. 1

STATEMENT of two lots of Chickens Fattened at Andover, N.B.

(Season of 1899.)

	1st Lot.	2nd Lot.
Number of chickens .....	200	152
Cost .....	\$50	\$46.36
Cost per chicken put in coops .....	25	30½
Grain consumed .....	2,319 lbs.	2,706 lbs.
Skim-milk consumed .....	1,257 "	993 "
Total gain in weight .....	446 "	228 "
Gain in weight per chicken .....	2.2 "	1.5 "
Grain consumed per pound of gain in weight .....	5.2 "	12.1 "
Skim-milk " " " " .....	2.8 "	4.3 "
Cost of feed per pound of gain .....	6.9 cts.	15.3 cts.
Sold per pair in England .....	\$1.45 "	\$1.57 "

The chickens in the second lot of the above, lost 21 pounds during the seventh or last week of feeding. Ordinarily it is most profitable to fatten for not more than four weeks.

Some of these chickens were sold in local markets and some were taken to public meetings of farmers for educational purposes.

Of 1st lot of above, sold by H. Baerselman, London:—144 chickens at 3 shillings each.

Of 2nd lot of above, sold by James Raddin, Liverpool:—95 chickens at 7½ pence per pound; 48 chickens at 7 pence per pound.

### STATEMENT of Chickens Fattened at Truro, N.S.

(Season of 1899.)

	1st Lot.	2nd Lot.
Number of chickens.....	210	210
Cost. ....	\$52 50	\$55 76
Cost per chicken put in coops .....	25 cts.	26 cts.
Grain consumed.....	2,800 lbs.	2,783 lbs.
Skim-milk consumed.....	3,900 "	5,247 "
210 chickens gained, first four weeks.....	217	
102 " next four weeks.....	96	
90 " first two weeks.....		67
210 " next six weeks.....		290
Grain consumed per pound of gain in weight.. ..	6·7 lbs.	7·8 lbs.
Skim milk " " " " .....	9·4 "	14·7 "
Cost of feed per pound of gain.....	9·9 cts.	11·9 cts.
Sold per pair in England .....	\$1·08 "	\$1·32 "

Part of the first lot were condemned as being mouldy when they were delivered in London. It was learned afterwards that the agent of the steamship had permitted green lumber to be put in the cold storage chamber beside them.

Of second lot, sold by Jas. Blackburn, Manchester:—192 chickens at 7 pence per pound.

## STATEMENT of Chickens Fattened at Charlottetown, P.E.I.

(Season of 1899.)

	1st Lot.	2nd Lot.
Number of chickens.....	241	216
Cost.....	\$60 25	\$54.00
Cost per chicken put in coops.....	25 cts.	25 cts.
Grain consumed.....	1,749 lbs.	1,685 lbs.
Skim-milk consumed.....	1,966 "	1,676 "
Total gain in weight.....	246 "	237 "
Average gain in weight per chicken.....	1 "	1.1 "
Feed consumed per pound of gain in weight.....	7.2 "	7.0 "
Skim-milk.....	8.1 "	7.0 "
Cost of feed.....	10 cts.	10 cts.
Sold per pair in England.....		\$1.37

The first lot of the above were shipped per SS. *Lake Huron*. Cold storage was not maintained on the steamer as agreed by the agents. The chickens were spoiled and they were charged to the agents of the steamer, who, of course, agreed to pay for them.

Of second lot, sold by J. & W. J. Courtenay, London :—84 chickens at 2 shillings and 8½ pence each.

Sold by James Ruddin, Liverpool:—106 chickens at 8 pence per pound.

Chickens were fattened also at stations arranged for by the Department at St. Hyacinthe, Que., Wolfville, N.S., Summerside, P.E.I., and Woodstock, Ont., but owing to neglect in weighing or in keeping exact records of the weighings by those in charge or to some other unprovided-for cause, full information is not available for publication to show the exact weights gained by the chickens or the exact weights of feed consumed per pound of gain in weight.

These were not experimental investigations into these questions, but were rather illustrations of the feeding methods. Of course the chickens at these stations were also well fattened, and some of them were sold for as good prices as the chickens from the other stations.

On the whole it may be concluded from our observations on the fattening that :—

1. Chickens of the smaller breeds, such as White and Black Spanish, Minorcas, Andalusians and others of that sort, do not give as good returns in the fattening as chickens from the larger breeds, such as Plymouth Rocks, Wyandottes, Brahmas, Indian Games, Dorkings and crosses of these;

2. Oats or other grain must be ground very fine, practically pulverized;

3. As a rule it is not profitable to fatten for a longer period than four weeks;

4. The use of the cramming machine is not necessary, but by means of it the chickens show a larger gain in weight for the quantity of feed consumed during the last ten days of the fattening period than when fed altogether from the trough;

(5.) All the directions in the notes for the guidance of feeders (at page D 18 to 20) should be carried out in every detail.



## APPENDIX No. †

## SHIPPING AND SELLING.

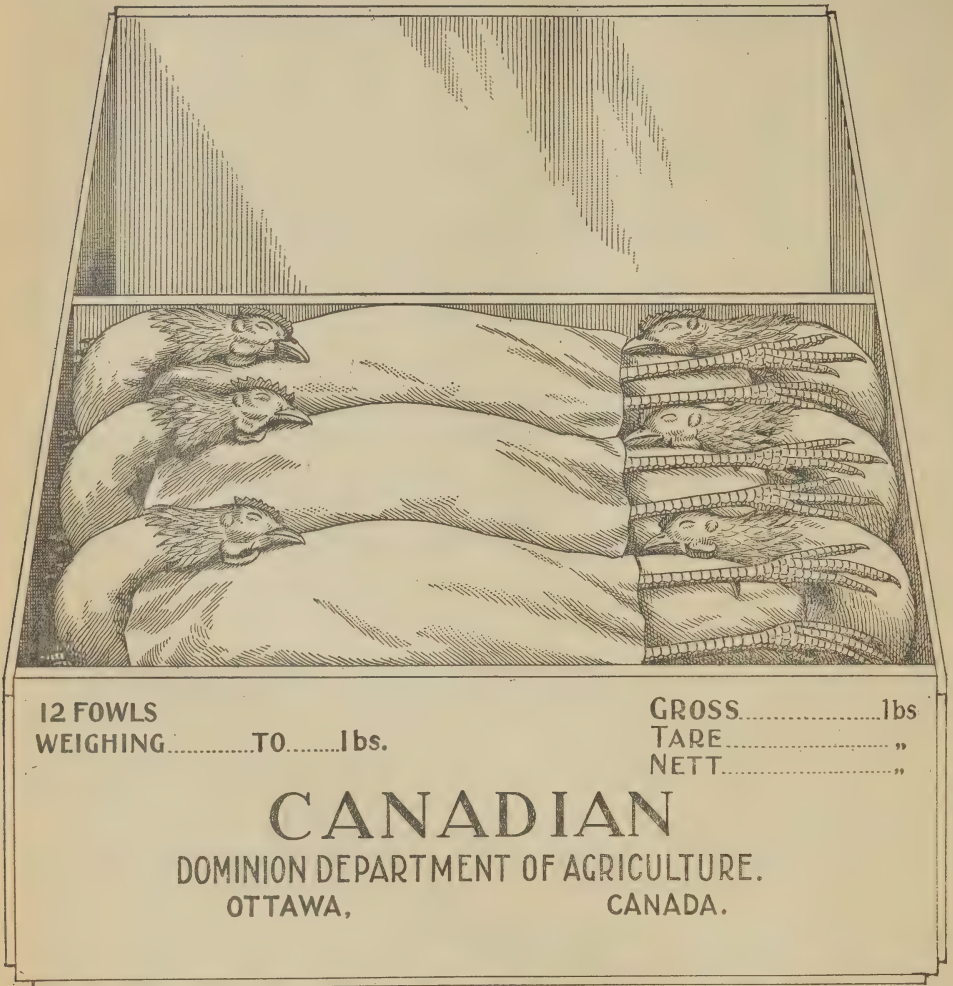
The chickens were killed by having their necks wrung. They were not bled and they were not drawn when sent to market. Their necks were broken, wrung in the usual sense of the word. It is done by taking the chicken in the hands, stretching the neck, holding the crown of the head in the hollow of the hand, and giving it a quick turn backwards. It is very easily done. The object of killing them in this manner is to avoid any mutilation of the chicken. The English buyer is very particular upon this point and will not buy a chicken that has had its head cut off. Some of the buyers recommend killing them by bleeding them in the roof of the mouth. When the chickens are killed they are taken and plucked while warm. It is not a very tedious operation when one is trained to do the plucking properly. They are plucked fairly clean; the pin feathers and down are taken off by the poulterers in the shops. The method adopted when plucking is to pull the feathers slightly outward and away from the tail end of the bird with a quick jerky motion. I never before actually understood the meaning of the expression "make the feathers fly" until I saw the plucking of chickens. They are plucked clean except a ring around the neck about an inch or an inch and a half long. Those feathers hide any discoloration at the point where the neck is broken. In some cases a few decorative feathers are left at the tips of the wings, but most buyers prefer them plucked entirely clean. When the chickens are plucked they are put on a shaping board. That may be a board about six inches wide, placed against a wall and making with the wall an angle of about 65 degrees. Or it may be a V-shaped trough with about that angle. As soon as each chicken is plucked its legs are laid alongside its breast. The stern of the chicken is struck or pushed against the wall and pressed against the angle of the shaping board or trough. Each bird is laid in with its breast downward. A glazed brick or other weight is laid on top, and another brick is put alongside to keep it in position until the next bird is pressed closely there. After the row is full, the chickens are left lying on their breasts with a board laid on top of them, with sufficient weight to hold them firmly and crush the breast bones slightly, but not so as to break them. While they are in this position the body is partly drained of the blood which collects in the neck. They are left there to cool, and set; and then they are packed in crates and shipped to market. The squeezing on the setting board gives them a more compact shape.

I found it advisable to starve the chickens for about thirty-six hours before killing them. In England they are not particular to starve them so long as that, because the chickens are sent to the market very quickly after killing. Here we found we should starve them for 36 hours, in order to have the crops quite empty, and thus avoid the risk of leaving any food in the crops and intestines which would ferment and spoil the flavour of the birds. They were plucked but were not drawn. A ring of feathers about two inches long was left at the head of each bird. They were placed on a shaping board as already described. After being thoroughly cooled each bird was wrapped in a piece of clean paper leaving the neck and head to project at one end and the legs at the other.

Shipping cases were made to hold twelve fowls each. The cases were 33 inches long by 19 inches wide by  $6\frac{1}{2}$  inches deep. The ends were one inch thick, as also was the centre piece across the middle of the case. The sides, top and bottom were of five-eighth inch spruce.

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Figure 4 shows the branding on the end of the shipping box. The figure shows one half of the box packed with six chickens. The other half is intended to hold an equal number.



Some of the buyers, particularly in London, preferred to have the chickens with the legs bent and pressed close to the body. In Liverpool the buyers liked them as shown in the illustration.

#### PRICES REALISED.

The fattened chickens were shipped to London, Liverpool and Manchester. The prices realized for them varied considerably. The differences were due to the size and quality of the chickens, to the condition in which they were landed, to the state of the poultry market at the time, and to the selling ability of the firms who handled them.

## APPENDIX No. 1

Taking 15 lots, containing altogether 1,860 chickens, which were sold in the three cities from October to March, the average returns show what may be expected from chickens delivered in good condition, as those were.

Number of chickens in 15 lots.....	1,860
Average weight per chicken.....	4·8 lbs.
Average selling price in England per chicken.....	68·9 cts.
Average price per pound.....	14·3 “

## Expenses per chicken—

Freight.....	5·5 cts.
Cartage, etc.....	1·5 “
Commission.....	3·2 “
Express in Canada.....	6·6 “

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16·8 cts.

Net proceeds per chicken at fattening stations.....	52·9 cts.
Cost when put in coops to fatten.....	25·5 “
Cost of food per chicken*.....	14·6 “

The following statement shows the returns from the chickens which wereshipped to Great Britain :—

1,860 chickens at 68·9 cents each in England.	
603 “ 65·8 “ “ nett.	
76 “ 60 “ “ in England.	
†504 “ 37·3 “ “	
71 “ No proceeds.	

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3,114

*By Mr. Wilson :*

Q. They were good-sized chickens ?

A. Yes ; they were sold in England for 68·9 cents, that is nearly 69 cents per chicken.

*By Mr. Bell (Pictou) :*

Q. And how much did they weigh ?

A. 4·8 pounds each. They were sold for a little over 14½ cents per pound wholesale. The ocean freight and the cartage and the commission and the express charges in Canada—because they had to go by express to the shipping point at Montreal or St. John, N.B., and it is rather unusual to convey large quantities by express—came to 16·8 cents per chicken. On some of the lots there were no English freight charges, so the amount to come off the price in England is on the average 16·1 cents per chicken. The net proceeds after all expenses were taken out, express charges, ocean freight, and English freight and commission, amounted to 52·9 cents per chicken at the fattening stations, or nearly 53 cents per chicken. The cost of these chickens put in the coops would be 25½ cents each ; and the cost of the feed consumed 14·6 cents per chicken. The balance was what you would allow for labour and profit. In some cases it was reported that the chickens happened to strike a dull and glutted market.

\*The ground grain was valued at \$1.25 per 100 pounds, and the skim-milk at 15 cents per 100 pounds.

†Some of these were reported slightly mouldy when delivered from the steamer.



*By Mr. Wilson:*

Q. About 12 cents for labour and profit together?

A. There would be a little over 12 cents per chicken.

Q. What portion of that do you think would pay the labour, one-half of it?

A. One-half of it easily, where a large number were fed.

Q. You mean one-half would easily pay it, do you?

A. Yes; besides, in the ordinary way of business, one would not pay express charges to the shipping point, and in several of these sales they struck a dull market.

Q. But would not that pay for our own market in Canada?

A. It does pay to fatten for it; but the trouble is in Canada there is not yet a large demand for chickens at 60 cents each, even for large fattened chickens. There are several people now fattening for the Ottawa, Montreal and Toronto markets, and getting good prices. I think there is a good chance for development.

*By Mr. Featherston:*

Q. If you took off the charge of exporting them, would you not get the price here?

A. That would be 53 cents per chicken.

*By Mr. Bell (Pictou):*

Q. Were they drawn?

A. No; merely plucked.

Q. The intestines were left in?

A. Yes.

I called on some of the men in England lately who handled them, and they made me verbal reports that these were about the best chickens they got from any place. They had pleased very well and there was a good demand for them. Out of the whole lot we sent, there were necessarily some not as good as others, owing to differences in breed, etc., but I have given the returns of this number, 1,860 chickens made up of fifteen different lots.

*By Mr. Wilson:*

Q. The others did not turn out so well?

A. Some of them not as well; of 3,114 chickens shipped, 1,860 netted 52·9 cents each; 603 netted 65·8 cents each. 76 were sold at 60 cents gross each in England; and 504 at 37·3 cents gross each in England. Some of the latter were from the lots landed mouldy, and some of the others were paid for by the steamship agents. We sent also 312 chickens on account of the men who looked after the fattening at Woodstock, Ont., and Summerside, P.E.I. These were sold at 8 pence and 9 pence per pound.

*By Mr. Rogers:*

Q. The fowls had no special breeding?

A. They were picked up in this way,—the men at the different stations had instructions to buy principally Plymouth Rocks, Wyandottes and birds of the large sized breeds, with white legs if possible.

*By Mr. McMillan:*

Q. Is the yellow leg objected to?

A. Yellow legs are objected to, but not so much as black legs. They are not liked so well as white.

I found the buyers in England wanted a great many chickens of a lower grade at a lower price; but I did not think it would pay us to send such. From the United States a great many go that are sold for one pound sterling, or \$4.80 per dozen wholesale. That price would not pay us for our fattened chickens. That was the

## APPENDIX No. 1

wholesale price, and the freight and other expenses would have to be deducted. Then there are very many chickens going in frozen. Russia is sending a great many of these at present. However, by sending ours of better quality we have had better prices.

*By Mr. Wilson:*

Q. Does not the freezing spoil the flavour?

A. Until recently it was supposed to, even in beef; but now by the process of defrosting there is not the same deterioration. The process of defrosting takes the frost out gradually, in about three days, from a quarter of beef. Our chickens were not frozen, except two lots; and they pleased, but no better than the others.

*By Mr. Featherston:*

Q. In this cramming process, did you find sometimes that they did not do well?

A. Sometimes. But if a chicken 'goes off its feed' it should be turned out for some days. I don't think it is necessary to cram, but the same number of pounds of food by the cramming machine makes more pounds of weight than when fed from the trough, during the last ten days.

*By Mr. Wilson:*

Q. There is the extra labour?

A. Yes. We also sent three lots of turkeys, and they pleased very well on the whole.

There is a large market for turkeys and chickens put up in the best way. The best way means starving them before they are killed so that the crop and intestines are empty, plucking them of nearly all the feathers, sorting them into uniform sizes, wrapping each bird in clean paper, and packing them not more than twelve in a case.

*By Mr. Featherston:*

Q. They should be cooled before they are packed?

A. They should be put on a shaping board to give them the square appearance.

Q. After they are cooled?

A. Immediately after they are plucked—before they are cooled; not so as to break the breast-bone but to give the bird the square appearance preferred in the English market.

Q. And packed so that when the case is opened it shows the breasts?

A. I found them packed both ways and it did not seem to make any difference, that is, the backs looked as well as the breasts. There is a hopeful outlook for this trade as you can see; probably a steady and large demand at 7 pence a pound; and if put into cold storage the chickens could be shipped up to March every year.

Q. Did you see any of those which had been sent from Toronto?

A. No, I did not see any of those from Toronto. It is a great mistake to send over all our poultry at Christmas time in the belief that the market is unlimited at that season. Prices are often higher at other times.

Then there was the difficulty of carrying them in cold storage without their becoming mouldy, as we afterwards found out. The first two shipments were landed in splendid condition; then one was landed in a mouldy condition. We then took means to prevent that from occurring again.

Q. What is the remedy?

A. Spraying all the paper in which the poultry is wrapped and the inside of the boxes with a ten per cent solution of formalin. That kills the spores of the mildew altogether. We found this difficulty in the cold storage on the steamships—if the chamber is not filled by the products suitable for being carried in cold storage the agents would put in deals, green lumber; and you know what green lumber is likely to cause when put in with poultry or meats. It is provocative of mould.

EXPORT OF FRUITS

TRIAL SHIPMENTS OF TENDER FRUITS.

Last year the trial shipments of tender fruits from Grimsby, Ontario, were continued. As in former years, the shippers of the fruits received from the Department a guarantee of their wholesale value at Grimsby. The fruits were packed by the individual shippers, were cooled in the cold storage at Grimsby, were forwarded in refrigerator cars to Montreal, and were despatched from there in cold storage chambers in the various steamships.

There were shipped last year in these trial shipments from Grimsby altogether 5,411 packages. Of these there were:—

Packages of peaches.....	127
Packages of pears.....	3,746
Packages of apples.....	1,456
Packages of quinces.....	82
	<hr/>
	5,411

Of the 3,746 packages of pears, there were:—

Grade A No. 1 .....	2,076
Grade No. 1.....	1,287
'Small' .....	383
	<hr/>
	3,746

Of the 1,456 packages of apples, there were:—

Grade A No. 1, bushel cases..	187
Grade A No. 1, half-bushel cases.....	507
Grade No. 1, bushel cases....	79
Grade No. 1, half-bushel cases.....	552
'Small,' half-bushel cases.....	131
	<hr/>
	1,456

Of the two classes of fruit, pears and apples which made up the bulk of the shipments, it will be observed that only a little more than one-half of the total quantity forwarded by the shippers was graded as A No. 1.

Particularly with fruit in small fancy cases it is desirable that the fruit should be of large size and of fine quality. The cost of the cases and the cost of the packing, cooling, and transportation cannot be borne out of the proceeds of any inferior or small fruit.

I made a fairly full report on the important points learned from these shipments to the annual meeting of the Fruit Growers' Association of Ontario; and I regret to find that this morning there is time for only a few remarks on their main features, to this Committee.

The apples, with the exception of a very few cases, were all landed in good condition. These were tender early varieties of apples such as could not have gone in the ordinary way. Some of them were packed in very small boxes, holding about 15 pounds each. I have called them half-bushel cases, but they were actually smaller.



## APPENDIX No. 1

*By Mr. Featherston:*

Q. That is such as Duchess?

A. Duchess and early apples of that sort.

Q. And Astrachan?

A. Yes. They were landed in good condition, but the package was too small; in consequence some of them did not fetch enough to cover the guarantee, which was 50 cents for the small cases.

Q. The small package was more costly?

A. Yes. These tender apples should go in boxes of not less than 40 pounds. Going in cold storage they would sell at remunerative prices.

Q. What did these sell at?

A. From 1s. 6d. up to 4s. per case.

Q. Of 15 pounds?

A. Yes, 15 pounds; but still even if they had all gone at 4s. they would hardly have paid. The sending of these trial shipments of tender fruit certainly gave the dealers and fruit consumers of England information that we had a large quantity of fancy fruit, though tender, which we could sell to them. Some boxes of 40 pounds each were sent, from which the shippers realised very good prices.

In the case of pears, the first shipment, through missing a steamer, was detained in cold storage at Montreal for a week. The last five shipments contained 2,605 cases of pears. These were put up in cases also weighing about 15 or 16 pounds of fruit to the case, and for them the government guarantee was 90 cents a case at Grimsby for the grade of A No. 1, which you will admit was a high guarantee. That was the guarantee which the shippers unanimously decided that they wanted, and it was given to them. Taking all the expenses of freight, which was unusually high, because often the car was not nearly full and full, car rates had to be paid, but after deducting all the expenses of carriage and selling, the net proceeds were only \$159.70 less than the amount guaranteed. That was 6 cents a package of net receipts less than the high guarantee.

Q. How many were there?

A. There were 1,609 cases "A No. 1," guaranteed at 90 cents; 823 cases "No. 1," guaranteed at 60 cents; and 173 cases "small," guaranteed at 50 cents. The loss was only 6 cents a package all round.

Taking the fruit of one shipper for all the shipments, the one who sent the largest quantity had \$94.60 of net proceeds above the guarantee. That shows that where the fruit was well selected and packed the proceeds of marketing was such as to leave it very profitable. Further to illustrate the difference between the prices realized and to indicate to what the difference was due, take this: in the first of the last five shipments I find these results, which I give for comparison. The pears shipped by Mr. Linus Woolverton netted 19.9 cents per case at Grimsby after the expenses were all taken off. In the same shipment, carried in the same car and by the same steamer, under the same conditions, the pears shipped by Mr. E. J. Woolverton netted 89 cents at Grimsby.

Q. What was the difference caused by?

A. I think it was in the condition of the fruit and the packing. In the case of Messrs. A. H. Pettit & Sons—the firm which netted \$94.60 over the guarantee—their pears in that shipment netted \$1.14 per case at Grimsby. They were sold by the same firm. So you see that wide range of from 19.9 cents, 89 cents, and \$1.14 per case, all sold by the same firm in the same market from the same shipment from Grimsby. Our experience indicates that the two sorts of tender fruits which we hope to send over, can be and have been sent over in such a way as to bring a profit to the shipper. We sent over some peaches, 125 cases in the last five shipments, and they were landed in good condition, but they are a very difficult fruit to handle successfully. The packing of peaches in cotton wool and placed in trays was much praised by the English trade.

Q. Had you any supervision over these shipments of fruit?

A. We saw after the transportation and selling of them.

Q. You had no control of the packing?

A. No, not further than an examination when they were delivered at the cold storage warehouse. The difficulty in extending an export trade in pears, I have explained in my report to the Fruit Growers' Association. In some cases the pears were a little too ripe; then there would be perhaps one half of them wastey when they got to England. On the other hand those who had skill and care enough to pick them when the pips were just turning brown found their pears reported as landed in good condition. We have insisted upon more careful picking and packing.

*By Mr. McLaren :*

Q. How do you account for those shipments spoiling in Montreal?

A. In that particular case the steamer left the day before she was advertised, and the pears arrived a little late. Every shipper complains of that sort of thing occasionally.

Q. I know we got into trouble ourselves in that way.

A. Fruits, especially very tender fruit, are a commodity exceedingly hard to handle safely. There is a very large export trade from Montreal in pears, and the man on the spot has the best chance of being successful. I gave a fairly full report on the shipment of large fruits in an address before the Ontario Fruit Growers' Association at their winter meeting.

Dr. SPROULE.—I think that might be incorporated in the report, and I move to that effect.

The CHAIRMAN.—Carried.

The following is the report of Professor Robertson's address before the Ontario Fruit Growers' Association at Whitby:—

#### COMMERCE IN LARGE FRUITS.

Mr. PRESIDENT AND GENTLEMEN,—I regret very much that other public duties kept me from being here to profit by the discussion that has taken place on the transportation of fruits. Transportation is a very important part of commerce, but not by any means the most important part of the commerce of fruits in Canada. If I may say one or two words in regard to commerce in general, I think you would be in a better position to understand what I would like to indicate, and I better able to learn from you what our Department needs to know from the men who are practically engaged in this business. Commerce is the exchange of things—of commodities. It is not a mysterious philosophy. It is the exchange of commodities—something for something. That is not stock-broking, and is not speculating in shares. These phases of business operations may be right or wrong, but they are not commerce. Commerce is essentially the exchanging of commodities. One of the essentials for success in commerce is to have a commodity to exchange which in itself will give you a relatively large value, because it is in good demand, or in other words, because many people want it.

In making the exchange, transportation comes in; and the better the transportation the more easily can the exchange be effected; but it does not necessarily affect the essential quality of the commodity you have to offer or of the money you may get for it. Unless the two—the commodity and the money—are good at both ends, safe commerce is impossible. I need not discuss money, because we have in the British Empire no question of the soundness of the pound or the dollar. The question is to get enough of them.

Fruit-growing in Canada has been adopted by a great many people who have not taken any trouble to learn how to carry it on. One has merely to look at the fruit trees that dot the face of the country to see that that is the case. It is shown by their kind, and their condition, and their general behaviour. There are some orchards that denote skill on the part of the man who manages the orchard; but for each such orchard I think there are ten orchards which are left to take care of themselves. The powers of nature take some care that the tree will be hardy and have



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some kind of fruit that will have seeds to reproduce it. The fruit-grower is after another object. He is after fine fruit to sell for a good price. The fruit-growers have been chiefly growing the varieties of fruit that grow easiest. Those may promise them a chance to hit any kind of market at any time of the year. We have too many men who have 'loaded' their orchards to hit anything in general, but no market in particular,—therefore they don't hit any market in particular.

## WHY A PREFERENCE IS GIVEN.

We need to have a few sorts and varieties of large fruits, and these in reasonably large quantities in each locality, else the general commerce in large fruits cannot make progress. Let me give you an illustration of that. We find Canadian markets during most of the fruit season filled with fruit from the United States. That's the fact. Why is it so, when we in Canada say we have more fruit than we can take care of, and are looking for outside markets,—outside markets with the very same sorts of fruit? The United States fruit that comes here has a uniformly good appearance throughout the package. That is worth a great deal. I talk to my friends in Ottawa, 'Why do you buy those Californian fruits?' 'Well, the fruit in the case is all the same.' I say to the shop-keeper, 'Why do you buy these?' 'Well, I have no wastey ones in them; they're all alike.' These two specific reasons, you see, are at the very threshold of commerce—are put there by the men who have the money to give in exchange. I mean the shop-keeper and the consumer. The Californian fruits have good keeping qualities. We may think that our climate and soil give a far better flavour, and I think they do in nearly all sorts of fruits; but the consumer says, 'I want good looking, sound fruit, that is fairly uniform all through the case.'

THE PARTICULAR *versus* THE GENERAL MARKET.

I come next to deal with the personal, particular market. There is such a market in every town in Canada, which the fruit-growers around those towns should be able to supply. The commerce of the locality is worth looking after. It is far better worth looking after than the commerce in the foreign markets. Every town in Canada would consume twice as much Canadian fruit if the people could get Canadian fruit of uniformly good size and good quality—not at a lower price; that is not the point. They are able and willing to pay a higher price than they have been paying. The question is one of fine quality throughout the whole package, with every fruit in good condition. The home, the house market will take all kinds of fancy, large, fine fruits at double the price of the general market for export. I am talking of the town I live in, and other towns. Why not meet that great unsatisfied market, and grow specially for it? That is where the money is made mainly.

## WHAT SPOILS THE HOME MARKET.

Then there is the general home market—I mean the market that is like our wheat market, the general market for the general good quality. The market of the North-west and Manitoba is a large market and a growing market for Canadian large fruits; but if any of you went to Manitoba and tried to reason with a Winnipeg man as to the desirability of taking Ontario fruit instead of United States fruit, he would smile and tell you he knew his business, and that you didn't; that he had tried Ontario fruit many times and that there was so much loss and waste that he could not stand the risk, and he wasn't going to try it again. I don't know whether what they say is all correct, but they are the men that have the money to exchange. They are unwilling to exchange what they have for what we want to give them, and that is what they say. I have personal letters from men in the North-west, and they say 'We bought a barrel of Canadian apples, and the top looked nice, but the



inside wasn't the same.' 'That is what they say. I don't know how it comes about that the small inferior apples gather in the middle of the barrel. I have never been able to account for it except in the light of a paper read at your annual meeting in St. Catharines, which explained it admirably and completely. The fruit grower assured us that ever since Eden the Devil personally inhabited each individual apple, and then moved his habitation about after he got in the barrel. I don't know any other way of accounting for it.

#### THE IMPORTANT QUALITIES.

I want to get your minds on the line of our greatest need for improvement. I have been hinting at these things—a uniformly good fruit all alike throughout the package; uniformly sound condition with good, keeping qualities for the shopkeeper and the consumer; and then excellent superior quality for those people who are willing to pay extra for such. For the general export market we need similar improvement. Every mail that comes from England brings me word like this: 'What we want in Canadian fruits first of all is soundness, and good-keeping qualities, and nearly uniform size throughout the package.' That is what they want. They want also a nice appearance, as large a size and as fine a colour and as good a shape as can be had. After that they want fine flavour. I have letters here saying that the Keiffer pears were taking better in the market last year than before. Now, who is going to stand up and brag about the Keiffer pear for quality of flavour or flesh? But for sound keeping quality they are quite the thing; and that is what the commercial men who have the money say about that pear—that it is taking better this year than it did the year before, and there is a reasonably good prospect for it. If we can get an equally good keeping pear and an equally good looking pear, or a better looking pear, with superior qualities of flavour and flesh, that is the one to send. I mention the Keiffer just to show that they are after these things first—soundness and good-keeping quality.

#### TRIAL SHIPMENTS OF TENDER FRUITS.

The Department of Agriculture made trial shipments this year, 1899. I shall make a few brief observations on them. These were trial shipments, mainly of pears, of peaches, and the more tender sorts of apples. We sent altogether only 127 cases of peaches, 3,746 cases of pears, 1,456 cases of apples and 82 cases of quinces. The main shipments were pears and tender varieties of apples.

#### SHIPMENTS OF PEACHES.

The peaches were packed in cotton batting so as to protect them against any possibility of bruising, and also against the warm, damp air of England when they were taken out of cold storage. Here are the returns—not very good in some cases. We sent not more than 30 cases at one time, except in one late shipment. 28 cases were sold for \$2.46, and realized at Grimsby net after all expenses were off, \$1.68 per case. These were specially selected peaches. There were 64 peaches in each case. The weight would be not more than 15 pounds of peaches.

The next lot of peaches, 30 cases, sold for \$2.99, and netted at Grimsby \$2.31, after all expenses and commission were taken off. Then 53 cases were sold at \$1.46, and netted 92 cents at Grimsby. I will read you an extract from only one letter in regard to that. This is from the consignee in Covent Garden: 'You will notice the good prices we made of peaches.' That was that second lot. 'We must say that whoever packed those did his work well. They arrived in splendid condition, and have, of course, met with good results. We think the Elberta peach is the finest, and ought to do well in this market.' We have not had much success in a general way in shipping Crawford peaches yet. That shows there is an oppor-

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tunity in England now for peaches—for small quantities—if put up in such a way as to be carried safely, and to have an attractive appearance when they are delivered.

## SHIPMENTS OF PEARS.

Then in regard to the trial shipments of pears. The returns from the pears vary very much, partly owing to the size of the pears and partly owing to the conditions of the pears as to ripeness. Some pears were landed a little too ripe, 'dozy,' and the latter shipments of pears were landed too green. With some, we hit it just right. We had some that were landed just right, some that were landed too ripe and some too green. Pears should be picked when the pips are about to turn brown. In the case of the very early and tender pears, they should be picked *just before the pips turn brown*. If the late pears are packed in that condition they don't ripen on the way, and when the English buyer cuts the pear down and looks at that part, if the pips are white, unless the pears are very fine he does not want them. If the pips are too brown he says they are going towards decay and they go into the hands of the jobbers. A very early and tender pear should be picked at an earlier stage of ripeness than the later pears which don't ripen so quickly. We all know that as a principle, but we have forgotten to put it into practice in the actual management of the shipping business. Here are the figures of one of the lots. Fifty-five packages of pears from Mr. Linus Wolverton were sold for 86·4 cents, and netted 50 cents at Grimsby. The package held about 16 or 18 pounds, the large ones a little more than that. The report to me from Manchester was that that was the actual weight of the pears. In another shipment ninety-five packages from Mr. Van Duzer were sold at 93·7 cents, netting 52·6 cents at Grimsby; and 145 packages in the following shipment, specially good, were sold in Manchester for \$1.97, and netted in Grimsby \$1.54 per case after all expenses were off. These were part of the same shipment in which the fifty-five packages from Mr. Linus Wolverton netted 50 cents per case. Those of Mr. Van Duzer's were Bartlett's.

The pears shipped by D. J. McKinnon & Sons in the last six shipments sold as follows: First lot, seventy-four packages, were sold at \$1.07 in London, and netted 65 cents in Grimsby; second lot, seventy-seven packages, were sold at \$1.21 in Manchester, and netted 82·2 cents in Grimsby; third lot, sixty-five packages, were sold at \$1.19 in Bristol, and netted 71·1 cents in Grimsby; fourth lot, sixty packages, were sold at \$1.23 in London, and netted 64·7 cents in Grimsby; fifth lot, eleven packages, were sold at \$1.90 in London, and netted \$1.34 in Grimsby; sixth lot, thirty-two packages, were sold at \$1.07 in London, and netted 64 cents in Grimsby.

These differences seem inexplicable, but the correspondence and my reports from Grimsby and from our own agent in London, indicated that every time when the pears were superior in quality, in size, and just right in condition, they fetched extreme prices and there was a great demand for them; whereas when the pears were small in size or not in good condition they struck a poor market. If you read the correspondence you would see the reason for the extreme differences in price in the same markets for fruit from the same shipment. Here are the returns from A. H. Pettit & Son in the last six shipments. First lot, six packages, were sold at \$1.59 in London, and netted \$1.14 in Grimsby; second lot, five packages, were sold at \$1.22 in Manchester, and netted 83 cents in Grimsby; third lot, fifteen packages, were sold at \$1.21 in Bristol, and netted 72·6 cents in Grimsby; fourth lot, eighty packages, were sold at \$1.14 in London, and netted 55·5 cents in Grimsby; fifth lot, 242 packages, were sold at \$1.97 in London, and netted \$1.40 in Grimsby; sixth lot, 132 packages, were sold at \$1.60 in London, and netted \$1.14 in Grimsby. The larger the lots the better they sell. If I were to quote you all the large lots only I would give you the best prices in every market. I mean, an appreciable quantity will fetch higher prices than five or six cases of a sort. All you want at this meeting are instances giving information to enable you to reach sound conclusions.

I want to read a few letters in that connection. This is from the consignee in Covent Garden, London, in regard to the size of the pears:—'We notice that most



of your fruit is small. Now small fruit on this market does not sell well. It must be large, bold, clear stuff. That is the reason of the success of California pears.' Now, that is the same firm that sold pears of ours later on at good prices when we sent them what they wanted. 'We think the size of pears you send should be no smaller than 60 or 62 in a case. When you get them up to 100 and 122 in a case that is very small.' I would like to read you one other brief reference from *North of England Fruit Brokers, Limited*, of Manchester:—'The quality of those you sent was most excellent especially the Clapp's Favorite, but there will have to be great improvement in the cold storage arrangement for transit, and much more care exercised to make the temperature suit the fruit, maintaining the same degree all through the voyage. If they could only be put in this market in the same condition in which they are put on your markets good business will be done.' That is in regard to the first shipment. Later reports say even from their standpoint the cold storage was all right. The fault was not in the cold storage; it was in Montreal in this case, where the first shipment missed the steamer and then had to be held over for the next. It was the holding of them that caused that over-ripeness. Then from W. N. White & Co. of Covent Garden:—'The Duchess pears have also done well. These hardy sorts of pears are sure to do well. There is not the same danger in shipping. As regards what you term French pears, there is no use sending them again here. They are what we call Bonne Terre and should come much later in the year. I cut one in two and saw that the seeds had not turned black, showing that the seeds were not properly matured.' Then also from the same firm:—'From experience we find that the pear is only fit for pulling when the seed is just turning black. If it is picked when the seed is white there is no keeping quality in the pear. Care must also be taken not to pick it over-ripe. The seed must be just on the turn.' These are large handlers of Canadian and French and Californian fruit. One thing more from the same firm, enclosing a cheque for the proceeds:—'We have already cabled you the net result and also the prices realized for the Duchess pears. These did very well, indeed, and large clear fruit will always do well. The Keiffer pears were also in good demand, but the peaches with the exception of the Elberta peach, are not much of a success. They seem to eat very harsh, and there is not much juice in them. The Elberta is much the better peach.' Then a letter in reference to the last shipment:—'We have already written you our views on these pears, and think if next year regular supplies are kept up, they will do well, especially the Duchess pears. The Keiffer pears will also do well on being better known.' I am not offering you any casual opinion of my own; I am offering you the judgment of the firm that has been sending us the money for that fruit—the exchange we want. Now, if they are willing to exchange good English gold for Keiffer pears, let us give them enough to get a good exchange.

#### SHIPMENTS OF TENDER APPLES.

I have only a little to say about apples. We sent altogether 1,456 packages. They were all landed in good condition. Nearly all pleased well, but there was a common complaint that the packages were much too small. The department was willing to let the shippers have their own way, and I also, with the shippers, was willing to make trial whether we could send fancy apples in small packages and make a good trade of it—I mean packages so small that there were about from 14 to 16 pounds net of apples in each. We found these too small. They netted some fair prices, considering the size; but still they did not pay. Taking off the expenses, which were very heavy, these small packages netted anywhere from a loss up to 21 and 36 and 47 cents, which, after all, is a good price for 15 pounds of apples. A 40 or 50-pound case is the case that they want as a minimum for fancy apples. We sent some half-bushel and some bushel cases. Here is one report:—'Apples. Speaking generally, we beg to say that in our judgment these boxes are much too small for apples. We think apples should never be put at this time of the year in boxes containing less than 40 pounds. That is still a small package. For the last six weeks very large quantities of English eating apples have come in our market



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and been sold at an average of 6 shillings per hundred weight, which were quite as good a quality and better condition than the shipped ones. Our English apples have not the colour that yours have, but we are inclined to think that the expense of wrapping them in paper and putting them in small packages, as was done in this case, is at this time of year inadvisable.' The same people wrote me later—a letter which I received only yesterday. It is not confidential, therefore I use the names. 'By the SS. *Manchester Trader* we received from Messrs. Pettit & Son and Mr. Andrews, of Grimsby, Ont., consignments of apples in boxes of about 45 to 50 pounds gross. The quality and size were really good, and such will always command good prices. We have written Messrs. Pettit and Andrews advising them to send all they can if they can ship the same quality and size, as we feel sure they will do well. We should be pleased if you would advise any of your shippers, if they hold this A1 stock, to ship it here, packed in 40 pounds net boxes and the apples wrapped in tissue paper. It is no use sending small or medium sized fruit, as there is plenty of this kind on the market.' Those apples, looking down the sales, sold from 7 shillings, and in fact, one lot of seven cases as high as 9 shillings—from 9 shillings down to 4 shillings and 9 pence per case for everything except the samples. Those are substantial good prices for 40 pounds of apples. At the same rate of expense as the shipments made by the Department, a package that size would cost about 40 cents for transportation and selling expenses. The freight charges varied according to the rates that prevailed on the ocean, and also as to whether a full car-load or not was sent. If they sold for 7 shillings with 40 cents to come off, they would net about \$1.28 per box.

## FANCY PRICES FOR FANCY APPLES IN BOXES.

I should think those apples would net about \$1.25 a box at Grimsby—perhaps a little better for a little less than a third of a barrel. That particularly fancy apples in fancy cases will fetch a fine price, goes without saying. I have a letter here from London, dated November 22, and Mr. Sheppard is also in the hall and he will let me give away, I know, some of the information about his business that came to me through another channel. This is what happened. I wanted to have three cases of very fancy apples sent to some friends in London, and I did not get word of that until all our shipments from Grimsby had been sent forward and disposed of. I wrote our agent to get three cases of fancy apples in London as cheap as he could and as good as he could, and send them with the compliments of the Canadian friend to these people. He wrote me: 'Sheppard's consignment of Fameuse apples arrived only yesterday. I had three cases sent as directed. I have written to each of the parties to whom the fruit was sent. The fruit is very fine, and so is the price, which was 21 shillings per case, and 1s. 6d. each case for carriage. The apples are retailed at 1s. 8d. per dozen.' That is quite a price. This letter says 21 shillings a case, and it was rather a favour to get them from one of the largest concerns in London, that has an almost unlimited demand. The case, I suppose, holds a little more than a bushel—196 apples.

This same letter says: 'On last Monday I called on several large firms in Bristol and saw a lot of Canadian apples, and I felt ashamed of my country. They were slack, wet, not well graded, dishonestly packed, many barrels being topped with good fruit, filled with perfect rubbish of many varieties. I counted twenty-five varieties on the bill of lading to a consignment of about 100 barrels. Some of the barrels have more than one variety in. The Elder-Dempster people were offering Fameuse apples' (those were Fameuse that we paid 21 shillings a box for) 'were offering Fameuse apples for 6 shillings a barrel, and could not get even that price—large barrels.' Compare that with Sheppard's 21 shillings for the box holding a little over a bushel! Now, I need not say anything further to emphasize the value of selection and quality and condition and packing and package for getting a big price and an almost unlimited demand.

## THE MAIN REQUIREMENTS.

Mr. President, I now put all these account sales and reports to one side. I have not given you a great deal of detailed information. I have given you perhaps what is better. I have given you impressions as to what the conditions are and what the possibilities are in regard to tender fruits. Each man must work out the methods for himself in his own locality. I now pass on to mention further what I think are improvements required for and in the commerce in large fruits. First of all, for the export trade there must be comparatively large lots of one sort and of one variety—not too many varieties in a single consignment. Then there must be fine quality and fine condition. The apples specially must be large and uniform and sound. Nature does not provide them of that sort on the trees. They are not uniformly large, and they are not uniformly fine in appearance, and they are not uniformly sound; but it will pay the shipper to send to the English market only those that are, and do something else with the others. There would be more money come into the country by sending out only the uniformly good fruit. The fruit must be fine in regard to flavour if we are to please and keep the trade permanently. There are one or two ways for the apple trade to gain that end. One of these is that the orchards shall be so large in their production that the individual grower can meet these conditions himself by having reasonably large quantities of each good variety he ships. If the grower of the fruit be not in a position to do that, then there must be a central packing and shipping place for the locality. I don't see any other means of putting this trade on a basis that will make it profitable commercially.

## GOOD COMMERCIAL MANAGEMENT.

Our cheese trade, which is bragged of a good deal, and perhaps deservedly so, will bring in something like \$19,000,000 this year. That is a reasonably large sum, and has grown from under \$6,000,000 within my recollection and active connection with it. That has been possible only by the trade being on this basis: production of uniform quality at the factories, and then the handling of that by competent commercial firms that select carefully and send only to each market what suits it. When Canadian cheese is quoted at a price it is bought on this side and the money practically sent here for it; it is not consigned as a rule. The possibility of that begins when the quality is of a standard sort, and is uniform throughout each lot; otherwise the men on the other side will not buy, they will compel consignment; and consignments of irregular inferior goods spell ruin. Now our butter trade is getting on as good a basis as our cheese trade. In 1894-95—that is not long ago—the exports of butter from Canada were worth about \$600,000; and this year because of more systematic manufacture and safe transportation, the exports will rise to probably \$4,000,000. I think they will increase \$2,000,000 further next year. That seemed impossible four years ago, when people said, 'Oh, you have no business sense, or you would not talk of those possible increases.' If you put the business on a safe commercial basis in regard to the production and the selection and the handling and the transportation, the English market will give you any amount of money for the right quality of food products. I mean they have the market and they have the money. I merely instance what has been achieved in those two products by those methods.

## IMPROVED ACCOMMODATION ON STEAMSHIPS.

The transportation on the ocean has not been of the best yet for either apples or tender fruits. It has been gradually getting better than it was. And now for the tender fruits, this is in contemplation for the next season: Instead of having large cold storage chambers—which were all we were able to provide for three years ago, because the steamship owners then would hardly do anything, thinking the business was not worth encouraging—we will be able to arrange for small cold



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storage chambers of from two to four carload sizes, so that tender fruits can go in a chamber by themselves and be treated as they ought to be, instead of going in as a side accommodation in a butter chamber. But we could not get as far on as that until this year. Now the Minister of Agriculture has arranged for small cold storage chambers on the ships, in which the temperature can be kept from freezing point or below freezing point up to any temperature required. The steamship companies say they will provide ventilated holds for apples. But providing these facilities does not ensure that the fruit will get the benefit of them; and there's the rub. There is no blinking that. I listened last year with a good deal of interest to the discussion which resulted in the appointment of a Transportation Committee of this association. There are cold storage cars on the railways; and there is plenty of ice in the ice-houses along the lines; and there are cold storage chambers on steamships; but these things don't act themselves; they don't bring about anything. All the Government can do, I think, in this matter, in the commerce of things, is to help to provide the facilities, and then the man who has the stuff in his care and at his risk must put the agencies into operation. Take the cold storage in railway cars for butter. It took three years to educate everybody—the railway agents and the men in Montreal and other men. Cold storage is a business that requires trained men to mind all the little things about it. And now the individual fruit grower must look after his own fruit as long as he has any risk in it, no matter what conveniences or facilities the Government provides, because the carelessness of those who handle it may prevent the facilities from being useful to the man who ships.

## BAD PACKING AND DISHONESTY.

The unfortunate position of the apple trade is due to one of two causes, and even to both causes combined—not only bad transportation and not only a bad packing, but sometimes bad packing and poor transportation combined to do the greatest possible damage to the business. One of the main causes of loss, however, is the want of skill in packing apples. I suppose everybody is born with ability to do a great many good things. I know most men are born with a consciousness that they are able to judge horses and make good speeches and run for parliament, only sometimes they don't get the chance. I hope no fruit grower will believe that he is borne with the ability to pack apples by intuition. It is a business that needs particular painstaking in the learning. I don't know yet how to pack apples. I have not packed many barrels myself—perhaps twenty or thirty with my own hands—but I have supervised the packing of a great many, and watched with care the packing of a great many more, and I don't know how to pack apples. I don't know how to make horse-shoes; I don't know how to make doors; I haven't learned the business. Do you see? I want to lay down the proposition that a man doesn't know how to pack apples until he learns the business of packing apples. You don't know it by intuition. You have to begin by learning a little and then adding to the experience a little more, until you know how to pack apples. By that process we would have a lot of trained men and women and boys able to pack apples. Then there has been great want of care, as well as lack of skill. Then there has been want of honesty. That ugly word dishonesty will somehow thrust itself in before the man who is examining our apple trade. He says to himself, 'I mustn't say that, because I will offend a great many Canadians.' I was told when I went before the Committee of the House of Commons a few years ago, 'You mustn't say anything reflecting on the honesty of the fruit growers and farmers, because everybody will be down on you.' That doesn't make any difference; because much as I strove against having any such opinion, the evidence would keep coming up, and keep coming up in the most irrepressible way that there is, somewhere and somehow and very often, simple dishonesty in the packing of the fruit. I cannot put it in clearer English, and I can't put it any stronger than by saying these few words. Is there any proof? I told you what we did last year. I would not even try to thrust the proof on the convention if it was not in the hope of making some amendment. I think the most



graceless and useless undertaking in the world is to go about finding fault unless one is finding fault on purpose, and with some ability to make remedies.

#### WHERE THE FAULT LIES.

Last year we had a great many fruit growers saying that the damage to apples was all done on the railways or on the steamships or in the markets of Britain; and nobody seemed to know where the damage did take place. Last summer the Minister of Agriculture authorized me to engage two men to watch the condition of the apples passing through the ports of Montreal and St. John, N.B., and Halifax, N.S. These men were not official inspectors—I mean they were not clothed with power to seize fruit—but they were Government employees to stay on the wharf and watch the loading of fruit in the ships, with instructions to pick out here and there average sample lots, examine some barrels and make me a report of what they found, with the name of the shipper and the name of the consignee, with the number of barrels and the car numbers. Some of these particulars I am not going to give to this convention; they were confidential to me as an officer of the Department.

The reports of the inspector at Montreal began on the 6th September. He picked out carload lots and the following are extracts from his report on several lots. 'Damp, and some barrels wet.' That was in Montreal. Then on the same day: 'A good many No. 2 apples in this lot.' That was another lot. Then on the same day, 'Brand XXX 100'—I don't know if anybody here knows the brand—'some of the apples were very small.' That is his report. Of course he found other lots: 'Apples in good order and the weather cool.' These were examined in Montreal before there was any chance of being damaged on the ship. In another report he wrote, 'This lot is in good order, certainly small, but sound.' And then, 'Packed loose.' Then another lot 'Badly spotted.' Another lot, 'Badly spotted.' Next 'Loose packed.' Then, 'A No 1 fruit.' Then the next lot, 'Apples rotten and loose packed.' Then the next lot, 'Some poor and slack and loose packed.' Next lot, 'Fruit only fair.' Next lot, 'Fruit some spotted.' Next lot, 'Fruit A 1.' Next lot, 'Fruit A No. 1 but small,' and so on. I am giving you quotations from the reports on the lots that went on five steamships in those three days. I can do that now without any hesitation, because those apples have all been sold in England. These were apples shipped in September. Sept. 21, 'Apples A No. 1, in good barrels.' September 22: 'Lot Blenheim Pippins rotten;' 'A No. 1, but fruit seemed a little on the small side.' September 26, 'Fruit A No. 1, barrels very poor.' September 27, 'Rotten fruit in good barrels.' October 2, 'Fruit A No. 1, barrels very poor.' 'A No. 1, good barrels and well packed.' October 4, 'Apples, fruit small and spotted.' 'Fruit poor and bad barrels.' 'Fruit A No. 1, poor barrels.' 'Fruit rotten and poor.' 'Fruit only fair.' 'Fruit, Pippins A No. 1; Snows poor.' Each one of these refers to a different carload. October 9, 'Fruit only fair.' October 10, 'A No. 1, but small.' 'Fruit small but branded No. 2.' 'Fruit spotted and poor, also small.' 'A No. 1, fruit in poor barrels.' 'Badly spotted.' 'Badly spotted.' 'A No. 1, but small.' 'Next lot small but A No. 1.' October 16, 'Rotten, and others fair.' 'Fruit some spotted.' 'Fruit rotten, others fair.' 'Fruit rotten and wormy.' 'Fruit only fair.' 'Fruit only medium.' 'Fruit A No. 1 but too tightly packed.' 'Fruit No. 1, but barrels wet.' 'Fruit badly rotten.' I am reading some of the worst ones, the reports on from one quarter to one-sixth of the whole number of carloads examined, taking more of the poor ones.

The inspector had no official power to disturb the fruit very much, so he did not disturb the barrels very much. He took a few apples off the barrel and looked down in them. Then, October 23, I will read you the comment on each lot in this report straight through:—'Fruit all No. 1.' 'Fruit only medium.' 'Fruit A. No. 1, good barrels.' 'Fruit A No. 1.' 'Fruit poor and rotten.' 'Fruit A No. 1.' 'Fruit very poor.' 'Fruit A No. 1, good barrels.' 'Fruit very poor.' 'Fruit poor stuff.' 'Fruit rotten trash.' 'Fruit A 1.' 'Fruit A 1.' 'Fruit fair.' 'Fruit poor and bad barrels.' 'Fruit only fair.' 'Fruit A No. 1, good barrels.' That is the summary of all the car loads reported on that one sheet.

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I will read you only two extracts from the inspector at St. John, N.B., and Halifax, N.S.:—‘The ventilation in most of the ships might be fairly good if only such care in looking after it could be secured as most people give to the preservation of their own property. Extreme roughness in the barrels, received both in the unloading from the cars as well as in the stowing of the ships, cannot fail to injure the fruit, and it seems to me under present conditions very difficult to control. In St. John the apples are unloaded from the schooners alongside the steamers, and fare rather better in that respect than in Halifax, where they are unloaded from the cars and then rolled through the freight shed that in wet weather is often very dirty, and the barrels get blacked up very much. This, however, is easily remedied, but certainly somebody should have more control of the rascals that smash and tumble the barrels at their sweet wills.’ (Hear, hear.) ‘Then the loading of these steamers is done mostly at night off the railway. Barrels are rolled across the warehouse and loaded into the steamers outside. It is quite impossible in this rush to catch anything from the marks on the barrels.’ There is what you find reported from intelligent, competent men, examining the fruit at our own ports before it leaves.

Now, it is not surprising that bad reports and bad sales come back from at least that class of fruit; and I have not picked on, and they did not pick on, any particular lots, but spent their time during September and October examining different lots, giving me a full report like that every week. There is something radically wrong to allow so much waste and so very great loss to go on in an important business like this.

## REPORTS FROM AGENT IN GREAT BRITAIN.

I want to say a little now as to what the agent we had, found on the English side. He also was an independent man, outside of commerce. This is in regard to apples:—‘September 2.—A lot of Nova Scotia apples were sold to-day at from 15 to 17 shillings per barrel, and that in a market glutted with English apples of all kinds, including windfalls. I noticed barrels with a thick paper at each end, as I suggested in my report to you last spring. I noticed the barrels opened up with a much handsomer appearance than barrels without paper, which had a bruised, and, in some cases, a dark bruised appearance. Neglect of that little point caused shippers a loss of 1 shilling a barrel. The best Nova Scotia apples are far better than the Ontario boxed apples in every way.’ Nova Scotia apples are not sold as Canadian apples. As I pointed out to the convention last year, in examining account sales, the percentage of wastey and slacks in Nova Scotia apples was about 6 per cent, and the percentage in Ontario and Quebec—so-called Canadian apples—was something over 60 per cent.

The Nova Scotia people have some advantage, and still they complain of the handling at St. John and Halifax, the rough handling; but the Nova Scotia orchards, perhaps, each produce a larger quantity of one variety than in Ontario. That is very important, and the Nova Scotia apples are nearly all handled by men trained to the apple business. Many of the London firms now have their own men and warehouses in Nova Scotia, and those that are not handled in that way are handled by large growers and men trained in the packing. These account for a great deal. I was speaking with a Nova Scotia grower the other day who, for three successive years, has done his own shipping from his own orchard, and his apples have averaged him in his orchard over \$3.05 net per barrel for three years’ shipping.

He has a good many Baldwins and Kings. He sprays five times a year, so that there are no spots. Two years ago he said he was astounded to find one man putting in small apples in a barrel, as the man thought, to help him out. He dismissed the man on the spot and gave him a dollar to go. That was told all around among his packers, and he says he has not had to dismiss a man since then.

This is from a report, dated November 22:—‘Nova Scotia fruit is well spoken of this current year, but the general opinion regarding Canadian apples’ (Ontario and Quebec provinces) is that they are worse this year than ever. I am looking



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into the matter, and will report to you later. . . . I saw a few barrels of Canada Baldwins well graded and nicely packed, but they were very wet. I should judge the wet is caused largely by the barrels being stowed in heated holds without ventilation. I have not heard complaints re Nova Scotia apples being wet or slack. The manager of the fruit department of the Army and Navy stores told me this morning that Nova Scotia apples were very good, but Canadian apples were most unsatisfactory in every way, and worse even than last year.' That is an unbiassed report, and it is along the line of the report from Montreal, before the apples were on the ocean at all. So it does not seem to me that the blame lies on the ocean transportation for the poor apples and the low prices.

I have one more letter. This is from Liverpool. The agent of the Department goes to Bristol and stays a week, and then goes to London, and then goes to Liverpool and stays a week, and looks for himself, and finds what he can learn. This is what he says: 'I called on Woodal & Co., Temple Court, Liverpool, re Canadian Apples and they complain very much about the quality and condition; they sold a lot of Ontario apples for 1 shilling and 9 pence per barrel (gross) this week (slack and wet). They find no fault with the shape of the barrel (bent staves), and prefer it to the Nova Scotia barrel. They account for the large number of slacks to the jolting on freight trains in Canada. The quality of apples they say is not so good this year, they are more liable to sweat and become soft, than usual. I asked them to send you catalogues of their fruit sales, which they will do.'

You see something of the condition of the apple trade. You knew it before I said anything. I have not come to give you information that is new to you all, but I have put it in the light of reliable and official reports received on this year's business.

#### IS LEGISLATION DESIRABLE?

I speak now with a good deal more diffidence, because this is a business with which you are more intimate and of which you are certainly better able to judge than I. I suggest this to your very serious consideration: Should there not be an application of some official recognized standard for apples packed for export? Should not the standard first of all include some designation that the minimum size of apples in a barrel is not less than so and so in inches? Should there not be some statement of minimum size, so that a purchaser buying a certain grade may expect that the apples in that barrel will not be under the specified size? Then should there not be some definite standard of quality in regard to soundness, to shape, and to freedom from blemishes? And then should there not be some standard of variety? I mean some enactment providing that only certain apples could be legally called Kings and Baldwins and Northern Spies, and that no other sort of apple could be legally called by those names. I would like you to think that out. Don't we need standards for these two things? I don't mean that we should make the branding of them compulsory. Should we not have some reliable measuring gauge for a barrel or other package of apples and pears? You could not do business if you said only to a man, 'I will sell you a box of cheese at so much per box.' It might be a big box or a small box. We need a standard for size of package and quality and variety.

Then let me make another suggestion. Do we not in Canada need some enactment that will require the branding of the name of the grower and the name of the packer on every closed package of fruit for export? Should we not require that? You say, 'what business is it to the government that a man should put his name on?' Well, the government is a form of co-operation of all the people to make this a desirable country to live in; and if it becomes more desirable to do business in by having this done, and no individual's liberty suffers injustice, why not do it? If a man brands the name 'John Brown, grower, William Smith, packer,' and on the package if he brands it 'A No. 1'—if that be the standard for quality—or if he brands it 'Northern Spy' and any inspector in Montreal or any other port finds a barrel of apples of John Brown's or William Smith's with something else than



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Northern Spy in it, and something that does not come up to the standard represented by the brand, then let that barrel and all similar barrels be taken at once and sold for what they will fetch, and the returns put in the hands of a committee of fruit growers to suppress fraud in Canada.

The object in putting the grower's name would be this: as far as he supplied good fruit he would get the benefit, from his own name being on the package; if he had bad fruit he is not liable to a penalty, but the putting on of his own name, if the fruit was condemned, would be a means of keeping him from selling to a packer who would dishonestly pack the next year. If you had not both names you could not trace the fruit so well. The grower would be under no penalty in any case unless he were also the packer.

If the grower lets the poor fruit go off his place mixed with the good he can't object to the buyer doing the best he can with what he buys; and that is what is 'playing hob' with the business. I am making only a suggestion, not even recommending this to you. You can discuss it. If a grower sells his orchard to a packer he is nevertheless the man who is most interested in the trade next year, and during future years. Now, his name appearing on the barrel would not make him liable for anything, but it would make it possible to trace the fruit back and send him word that some fruit with his name on it was found badly packed and found so as to do the fruit trade of the country harm. It is for you to discuss these things. I suggest that the brand should include a designation of the minimum size, should include a description of quality according to a standard, and should have a statement of the variety. I would suggest also that legislation should require the names and addresses of the grower and packer on every closed package of fruit intended for export. I venture the third suggestion that it is desirable to impose some penalty for neglect or violation of such regulations if, and when, made. I lay these three expressions of opinion before you. I think some action in this direction is necessary to put the commerce in large fruits on an honest and safe and profitable basis.

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Having examined the preceding transcript of my evidence, I find it correct.

JAS. W. ROBERTSON,

*Commissioner of Agriculture and Dairying.*



## TUBERCULOSIS IN CATTLE.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, June 20, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock a.m., Mr. McMillan, Chairman, presiding.

THE CHAIRMAN.—We have here with us to-day Dr. McEachran, Chief Veterinary Inspector for Canada, and Dr. Higginson, V.S., who will tell us about their experiments in connection with tuberculosis in cattle. Before we hear them, though, we would like to have a few words from the Minister.

HON. SYDNEY FISHER, Minister of Agriculture.—Mr. Chairman and Gentlemen,—I feel that this meeting of the Committee is one of very great importance. We are here to-day to hear the account of some work that has been done in Canada which, I think, is of importance, not only to us in this country, but will be sufficiently of interest to be noted the world over, wherever the health of animals is concerned. You have all followed the inquiry into tuberculosis as a disease of horned cattle, and are well aware of the large interest that this disease has assumed everywhere. Very great care, and skill, and time, and money have been devoted to experiments in connection with this disease—experiments or investigations, perhaps I ought rather to say. Parliament was good enough to place in my hands a few years ago a sum of money for the purpose of dealing with this disease in Canada, and you are aware of the work that has been done in that connection. But there is another piece of work which has not yet been made public for reasons which I will state shortly, and which we hope to-day to make known to you and, through you, to the public at large.

A few years ago our friend and fellow-member, Mr. Edwards, came to me and informed me that in his very large and magnificent herd of Short-horn cattle tuberculosis was prevalent, and indeed very extensively; that he had this herd tested and found a large number of the animals diseased. It was a great blow, as one can easily understand, to Mr. Edwards, who had a herd which showed outwardly good health and good quality. Discussing the matter with him, I suggested that he should undertake to try to utilize these diseased animals to the best possible advantage, and instanced the work that Prof. Bang had been doing in Denmark as a guide by which profit might be made of these diseased animals. I have frequently said that where animals are of no great value it is best to get rid of them at once, but where you come into contact with a herd where every individual animal in it is worth several hundreds of dollars it seems a waste and shame to destroy them if there is any possible way to utilize them. Mr. Edwards fell in with the view, and undertook to spend a considerable sum of money, and to take great care, and to go to much difficulty to complete the arrangements for the carrying on of this work. I believed that this experiment was of such importance that it was well it should be watched and checked officially, and the results published for the benefit of the community at large, and I considered it was of great public advantage to Canada that we had in Mr. Edwards, his buildings, arrangements and farm, the opportunity of carrying on this work at the expense of a public-spirited citizen, with only the expense to the country of checking it and reporting on it.

I therefore secured the services of Dr. Higginson to take the work of looking after these experiments. Dr. Higginson has been constantly and uninterruptedly



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at Rockland with Mr. Edwards' herd since then, watching all the experiments and noting all the results as an officer of my department. Mr. Edwards has followed the scheme laid down by Dr. McEachran completely, carefully and thoroughly, and Dr. Higginson has been there as an officer of the department to see it was so done and to check and make elaborate notes of the work. We have here to-day Dr. McEachran and Dr. Higginson to give notes of the work to the Committee and through it to the country. I may say before sitting down and leaving it to these officers to give the details, that the results are eminently satisfactory and extraordinary, and show in a marked degree the same results that Prof. Bang's work in Denmark have shown, that they corroborate his work almost completely, and that here in our midst, close by our capital, we have had a work going on which is of immense value in regard to the investigation of this disease. The result of the work, I think I am safe in saying, and I think you will judge when the details are laid before you, are such that we can say that the careful utilization of animals diseased with tuberculosis is quite possible, and that it is quite possible for those who have the most valuable herds to find out whether these herds are in any way diseased and if so to utilize them without slaughtering them, so that they may in a short time practically speaking eliminate the disease from the herd without the loss which immediate slaughtering would entail, and that in a short time with the proper carrying out of arrangements such as have been carried out by Mr. Edwards, even though the disease may be found in any of the great thoroughbred herds of the country—a possibility which I must recognize though I hope it will be rare—the owners of these herds will feel sure they can utilize these animals for years and eliminate the disease.

*By Mr. Sproule :*

Q. You mean to keep them on ?

A. No, I mean gradually getting rid of the animals diseased as their utility ceases, but in the meantime keeping them and breeding from them without the produce of the diseased animals being necessarily diseased or even likely to be diseased. I won't detain the Committee longer, but I think it well to put this short statement before them, and I ask them to pay careful attention to the statements which Dr. McEachran and Dr. Higginson will lay before the Committee, because I think these statements are of such value to the live stock breeders of Canada that this meeting of the Committee is one of the most important we can hold during the session of parliament.

THE CHAIRMAN.—We will now have the pleasure, gentlemen, of hearing from Dr. McEachran regarding these experiments which were carried out with Mr. Edwards' herd.

DR. DUNCAN McEACHRAN, F.R.C.V.S., Chief Veterinary Inspector for the Dominion of Canada, being present at the request of the Committee, made the following statement:—

#### DENMARK ALARMED.

MR. CHAIRMAN AND GENTLEMEN,—Reference has been made by Mr. Fisher to the work of Prof. Bang, who is the chief veterinarian for the government of Denmark. It is well known that within the last ten or fifteen years Denmark has come rapidly to the front in the development of her dairying interests, so that to-day they are the largest producers of dairy products in the world, and even export largely to Great Britain butter and other dairy products. When the government of Denmark took this matter into their serious consideration, they were met with the difficulty of the existence to a large extent of a contagious disease, tuberculosis, which is well known to be the analogue of consumption in the human family, and well known also to be so closely related to each other that consumption in the human family has often been produced by people using milk, butter or even cheese,

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if not sterilized, from animals suffering from diseased udders. Fortunately diseased udders are not a common occurrence, otherwise consumption in the human family would be much more prevalent.

The Government of Denmark set Prof. Bang to work to devise some means by which these animals could be utilized without absolutely destroying them. In Denmark they pay great attention to breeding, and by careful selections had produced certain families of valuable milking strains which had taken years of careful breeding to cultivate. To deal with them as is usually done with contagious diseases, viz., kill them off, would be setting back the whole dairy industry of Denmark for many years.

## PROFESSOR KOCH'S DISCOVERY.

Some years ago Prof. Koch, in experimenting to find a cure for consumption, cultivated virus from the bacilli from the bovine tubercule, and he expected that the injection of its attenuated product, tuberculin, would cure that disease in the human subject. It did not, but on the contrary aggravated the disease; but it was found that wherever tuberculin was injected in consumptive people it caused fever, quickening pulse and elevating the temperature, conditions which showed that consumption existed. Finding it was useless in the human subject as a curative agent, experiments were made with animals and it was found, and found conclusively, that it is an almost absolute test of tuberculosis in them. It is true it does not indicate the degree to which the disease exists, but it indicates its presence even where it is impossible to detect it by chemical examination. I want you to carry that in your mind to explain something in this report that tuberculin may not always be infallible, but where honestly applied is a very valuable means of discovering and promoting the eradication of tuberculosis. We find in this country, judging from the tests made during the last three years, that it is correct in 98 per cent of occult cases. Prof. Nocard of France, whom I met while over there in 1898, says 'tuberculin cannot lie, never does lie.' Prof. Bang does not claim so much. Prof. Ostertag, in Berlin, agrees with Prof. Bang, he claims correct diagnosis in 87 per cent. The United States claim 98 per cent as we do, so you will see it is a very reliable test although it does not show the degree to which the disease exists.

## PROFESSOR BANG'S TREATMENT OF TUBERCULOUS HERDS.

Prof. Bang using this test in the cattle discovered all the diseased animals in the herds tested. He then conceived the idea from post mortems on calves that the disease is not hereditary, that heredity exercised but very little influence in its prevalence, and that if the disease was not hereditary but contagious the calves taken from these cows, even if the mothers were diseased, were removed to sterilized buildings or buildings never used by diseased animals, and fed on sterilized milk or milk taken from cows never diseased, they would be free from the disease and so the purity of blood built up during these years of breeding would be saved. Experiments were made and it was found that tuberculous animals reacted even when they did not disclose the disease by clinical symptoms, whereas others did not.

His observations and those of others disclosed the fact that all tuberculous cattle are not equally infectious; that those with diseased udders give virulently infectious milk; those with diseased lungs coughed up bacilli, which also were given off when the intestines, the uterus or the kidneys were diseased. In fact that in all cases in which organs the excrement or secretions from which are passed out of the body, become diseased, the bacilli drying may be moved about and inhaled in air currents and so spread the disease. Therefore, in selecting animals he took those in which the disease was only found by tuberculin, and with them conducted his breeding experiments. These animals were put into a special building and there kept till they were slaughtered or died—in fact quarantined for life—but the calves were taken away before they suckled, before the mother nursed them, and were with



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most gratifying results fed on milk from healthy cows or milk which was sterilized. With very few exceptions the calves proved to be healthy. To Prof. Bang belongs the credit of giving this most valuable discovery to the world.

I visited Prof. Bang in January, 1898, spent a week with him and discussed his system fully, so that when the minister, in June of the same year, informed me that tuberculosis had been found in the herd of Mr. Edwards and asked me to visit Mr. Edwards' farm and advise him how to carry out Prof. Bang's system, I did so, and was delighted to find that Mr. Edwards, with commendable public spirit, was willing to allow me to suggest any experiments that occurred to me, based on the knowledge and information I had acquired abroad, and these experiments he would see were carried out to the letter. Now, I do not think I can do better than read the letter sent to Mr. Edwards, telling him the proceedings to take, which will describe to you what I suggested. It is as follows:—

MONTREAL, June 29, 1898.

DEAR SIR,—‘I would suggest that in dealing with your cattle with a view to carrying out Professor Bang's system, by far the best plan is to remove every reacting animal young and old to an isolated farm which will be all the better if several miles away from your main farm buildings.

‘As none of them at present show any clinical symptoms they can be bred from and their calves if removed as soon as born and nursed by tested cows in a building, say the home farm buildings, which have been thoroughly disinfected, or better still in a new building, which you propose to erect in rear of the main byres, the greatest care being exercised in preventing the cow licking her calf, or its sucking the mother. These calves are to be tested with tuberculin when six weeks old, and any reacting must be killed. They will be tested every six months, thus making sure that no tuberculous ones remain amongst them.

‘By this means you can preserve the improved blood and raise a healthy herd from the diseased cows. These cows should be kept in the best of hygienic surroundings—and kept out of doors as much as possible—any of them developing clinical symptoms should be destroyed. I would suggest as an experiment that a few common calves from healthy cows (both cow and calf having been tested) be put on to suckle the diseased cows and cohabit with them to prove the communicability of the disease by this means, and a few similar calves be kept in a non-infected building perfectly isolated and fed on milk drawn from the diseased cows, both sets of calves being tested every three months: any reacting being killed and a careful post mortem examination being made.

Now, I just wish here to state that here was a breeder with a valuable herd of Short-horns. If any other system had been adopted, it would have stopped the sale of the cattle at once. Dealers knowing there was tuberculosis in the herd would not have bought them. Now, you see a man with a herd if he follows this system and isolates the cattle affected and the cattle the progeny of which he is offering for sale he can go on selling them as Mr. Edwards did.

‘The breeding of the non-reacting portion of the herd can thus go on with every confidence, the testing being repeated every three months, and any reacting cattle removed to the diseased herd. The byre should be disinfected on every occasion a reaction takes place. By this means as I explained to you your business of breeding and selling can go on undisturbed; the diseased ones having been removed and being miles away from your healthy herd.

‘I have considered your proposition to divide the large home byre by a close board partition into two (1 and 2) to keep the healthy animals in No. 1 and the diseased animals in No. 2. While it would be quite possible to carry out Bang's system by this means, I would strongly urge the advantages of removing them to a separate farm as above indicated. Buyers would certainly have more confidence in the freedom from disease if there was absolutely no disease on the premises or diseased cattle on the farm.’

Now, I may say that in Denmark, where as in Canada, many of these cattle are in the hands of poor men who cannot put up new buildings or get new farms as Mr. Edwards did, at the same time Professor Bang has succeeded admirably in cutting off portion of the byre by tongued and grooved boards, even with a door between them. But Bang did not recommend it and I certainly would not. I think it is better in this country where lumber is so cheap to put up new buildings and isolate the cattle.

‘Should the diseased cattle have more milk than can be used by the experiment calves, it may be made use of for feeding purposes for calves or pigs without risk of infection if it is raised to 180° F.’



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Now, there is a very important statement, which shows that not only the animals can be used and saved, but their milk may be used, as Mr. Edwards says it was used in his case.

This temperature will kill the bacteria, without giving a taste to the milk or interfering with its usefulness for butter and cheese making, such as occurs when it is boiled. This sterilization will require special apparatus and experienced management.

Mr. Edwards provided special sterilizing apparatus and used it with excellent effect in sterilizing milk drawn from cows which had shown reaction.

'In the event of your deciding to kill any of the reacting cattle—on making a post mortem examination if the disease is found to be limited and local—the flesh is considered fit for food, but it should be thoroughly cooked before being eaten; if it is general in the cavities of the belly and chest the flesh should be condemned.'

That is important. It is the experience of the whole scientific world that the flesh is quite fit for food when the disease is local, and not general. When it affects the mesenteric glands, the bronchial glands, or the organs of nutrition and general circulation, the muscles and flesh are apt to contain bacilli, but if it is local—as when occurring at the bifurcation of the trachea, just where the air tube passes off to the right and left lungs; which is a very common situation—and if there only; the flesh may be quite fit for food. 'But it should be thoroughly cooked before being eaten.' These are the four conditions that are known to be specially infective and animals showing clinical symptoms of these conditions should not be kept in the herd on any account, but should be destroyed and no use made of them:—

*A*, when the lungs are specially affected; *b*, when the udder is diseased; *c*, when there is diarrhœa, indicating disease of the intestines; *d*, when there is tuberculosis of the uterus. No cattle should be brought into the herd without being tested and found free from disease. Disinfection cannot be too thoroughly done. Every board, joint, corner or crack or crevice should be thoroughly exposed to steam which you can easily arrange; then with a spraying pump a solution of commercial carbolic acid, a pint to two gallons of water, should be thoroughly sprayed on to the divisions, floors, feed boxes, walls and ceilings, and the loose boxes whitewashed to a height of eight feet from the floor.'

Mr. Edwards used a solution of creoline; it is a very simple substance to use, easily mixed and very easily applied.

## VENTILATION.

'I would suggest that the ventilating shafts be enlarged and divided as I explained to you verbally and as indicated by the following rough diagram, the division boards coming only to within three or four feet from the ceiling—with a regulating shutter. It may be divided into two or four shafts if four they should be placed at the points of the compass. I will see that Mr. Higginson is well instructed in all the details of testing and carrying out the suggestions made above—and in recording regularly symptoms, temperature and reactions, also observations as to the effects of exposure to infecting media. I may say that being a firm believer in Bang, I feel satisfied that you can rid your valuable herd entirely of the disease with but little sacrifice, owing to their being useful for breeding from; a position once attained with a herd of such excellence in individual merits and breeding, will enable you to command a market in the United States or Canada far beyond your ability to supply, while others who are indifferent about it will find it difficult to sell animals which cannot be guaranteed free from tuberculosis, or evidence produced by their having stood the tuberculin test.

'Yours very truly,

'DUNCAN McEACHRAN,  
'Chief Inspector.'

That, gentlemen, is the letter of directions which I wrote to Mr. Edwards and which he placed in the hands of Dr. Higginson and which was carried out to the letter. Will Dr. Higginson read the report?

MR. EDWARDS—I think if you would read it, Dr. McEachran, we would be glad.

## DR. HIGGINSON'S REPORT TO MINISTER OF AGRICULTURE.

A. This is Dr. Higginson's report, addressed to the Minister of Agriculture, and dated at Rockland June 9.

'I have the honour to report to you as follows regarding the experiments carried on by me under the direction of Dr. D. McEachran, Dominion inspector, with cattle affected by tuberculosis on the farm of W. C. Edwards & Co., Ltd., Rockland, Ont.

In the spring of 1898, it was discovered for the first time that tuberculosis prevailed to a considerable extent in the above named herd, while at the same time the entire herd presented a robust, vigorous and healthy appearance and no outward symptoms prevailed whatever which would lead to the slightest suspicion that tuberculosis was prevalent in the herd.

'On accepting the appointment made by you to carry out certain experiments, and on receiving my instructions from Dr. McEachran, I proceeded as directed by him as follows:—Every animal in the herd was subjected to the tuberculin test and all animals which reacted under the test were separated distinctly from the animals which did not react, and since that date the two herds have been kept as positively and distinctly separated as if they had been many miles apart. The stables and premises in which the herd had been kept previous to the discovery of the disease were most carefully cleaned and thoroughly disinfected as directed by Dr. McEachran, with the use of carbolic acid, sulphur and creoline, and all were carefully whitewashed. A new stable and sheds were erected at some distance away in which to house the portion of the herd which was found diseased, and in summer the two herds have been kept in separate and distinct pastures far removed, so that there has been no contact whatever since the first separation was made. In the spring or early summer of 1898 both stables and sheds on the farm were carefully cleaned and thoroughly whitewashed, and I understand the same is to be now done again in a few days, and is to be an annual process each summer hereafter on this farm. In the season 1898-'99 twelve calves were dropped from the cows of the diseased herd, three of which were lost within a few days of their birth, which loss I attribute to the immediate change to nurse cows without having any milk from their dams. Of the nine calves successfully raised, five were raised on nurse cows and four were raised up on their own mother's milk, which was sterilized before being fed to them.'

That is very likely to be the case because the new-born calf requires the coles terine contained in the first milk to clear out the meconium from the intestines, so it is quite likely Dr. Higginson's explanation is the true one.

'In May, 1899, I again tested the entire herd, including the nine calves so raised, with the following result:—The nine calves here named, four of which were heifers and five of which were bulls, all passed the test most satisfactorily, but in this test three of the cows which passed the test the previous spring reacted, and seven of the cows in the diseased herd did not react in this test. In the spring of 1899 I took a calf from an outside healthy cow, which cow I tested, but which did not belong to or have any connection with this herd, and I had it raised on the milk of one of the diseased cows, the milk being in its natural condition as taken from the cow. I also raised two late calves from diseased cows on pasture, allowing them to run with their dams the entire summer. In October I tested the three calves above stated and all passed the test satisfactorily. In the same month before beginning to stable the cattle I again tested the healthy herd, all passing the test satisfactorily.'

*By Mr. Sproule :*

Q. But did he test the calf as well?

A. Will I read that again: 'I also raised two late calves from diseased cows on pasture, allowing them to run with their dams the entire summer. In October tested the three calves above stated and all passed the test satisfactorily.'



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Q. But in the case of that calf which he took from an outside healthy cow he tested the cow but not the calf?

A. We do not test calves till six weeks old, they are too delicate; the result showed the calf was healthy.

The report continues:—

‘I will now deal with the results for the season of 1899-1900. Eighteen calves were dropped from cows which had responded to the test. This season one calf only was lost and none were raised upon sterilized milk. Six of these calves were raised upon their own dam's milk, but never entered the premises in which their dams were housed, but were kept in entirely separate quarters and sucked their mothers in the open yard, not being allowed together longer than just a sufficient time for the calves to suck. Eleven calves from diseased dams were raised on nurse cows, in each case the calf sucking its own dam once before being transferred to the nurse cow.

‘This spring I again carefully tested the entire herd with the following results: In the healthy herd, including in its number the four heifers which were raised the previous year from diseased cows, all passed the test most satisfactorily. Of the six calves raised on their own dams as described, five passed the test and only one responded. Of the eleven calves raised upon nurse cows as described, ten passed the test and one only responded. In this test eleven cows in the diseased herd showed no reaction. In this eleven were included five which showed reaction in the spring of 1898, and were included in the seven which showed no reaction in the spring of 1899. The remaining two of this seven were slaughtered.

‘Since the time I took official charge of this herd, all animals slaughtered from the herd were slaughtered under my supervision and inspection. In November, 1898, twenty-two animals were slaughtered. Of this number I condemned four as unfit for food. In the eighteen animals whose beef I found perfectly good for food, slight traces of the disease were found in the lungs, and in some instances in other internal parts, but in each instance the beef was perfectly sound and good. In April, 1899, I had slaughtered one cow whose carcass I found perfectly sound and good, but found slight traces of the disease in the lungs. In June of the same year I had another cow slaughtered whose beef I condemned as unfit for food. In December, 1899, I had two cows slaughtered whose beef I found sound and good. In one case, however, I found slight traces of the disease in the lungs, but in the other case I could find no trace whatever of the disease. In April, 1900, I had another cow slaughtered whose beef was sound and good, but I found slight traces of the disease in each of the lungs and the liver. Again in May of the present season two cows were slaughtered, in neither of which any signs of the disease were perceptible to the naked eye. One of these cows and the one killed in December, 1899, which showed no trace whatever of the disease were included in the seven which were among those which reacted in the spring of 1898, but which showed no reaction in 1899.

‘The foregoing gives as briefly as I can put it the result of the experiments which have taken place, and the results from slaughter from this herd since my appointment by you in the spring of 1898, and if you will allow me I will give you the deductions which I personally draw from the experiments which have taken place. First, there is now no doubt whatever in my mind but that with reasonable care tuberculosis can be eradicated from any herd, and it is not at all necessary or desirable to slaughter valuable breeding animals. Nor do I consider it essentially necessary that the large expense W. C. Edwards & Co. have gone to need be gone to the full by others in their desire to profit by the satisfactory and valuable experiments that have been carried out on their farm. Reasonable separation I consider desirable, and good drainage, good ventilation, and plenty of sunlight, as well as general cleanliness, I consider essential in preventing or eradicating the disease. Housing cattle too closely together in dark, unwholesome and ill-ventilated stables in my mind has done more to promote this disease than any other cause. That sound calves can be successfully raised from both diseased dams and sires is fully established by the experiments that have taken place here, for I may here state,



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that one of the three stock bulls kept on this farm is diseased and his calves come out as successfully as those of the sound bulls. Further, from the experiments which have taken place here it is clear to my mind that, while there is unquestionably danger in calves being nursed by their own dams who are diseased, this danger I, however, think exists more particularly in case of diseased udders, uterus or intestines, and in cases where the cow suffers from generalized tuberculosis; but I think it possible that many tuberculous cows may suckle their calves if reasonable precautions are taken as was done in the experiment subsequently described. I would not, however, recommend this practice, it is attended by too much risk. That the disease can be cured I am unable to say; the experiments which have taken place here do not warrant me in expressing an opinion. I am, however, firmly convinced that under such conditions of ventilation and proper housing as I have described, with separation, the disease can be checked, and in a reasonable time totally eradicated.

'I will simply add this, that the general condition of the stock on this farm, so far as all external appearances would indicate, has been of the very best, since my experiments began; that without the tuberculin test no discovery of the disease could have been made, and, while the test may not always be infallible, all that has transpired here to my mind most strongly recommends its usefulness where honestly applied as a great means of discovering and promoting the eradication of tuberculosis. All of which is respectfully submitted.

'I have the honour to be, sir,

'Your most obedient servant,

'GEO. W. HIGGINSON,

'Veterinary Surgeon.'

DETAILS respecting each animal which calved seasons 1898, 1899 and 1900, and their produce, in matter of experiments with tuberculosis, on farm of W. C. Edwards & Co., Limited, Rockland, Ont.

1898.

No. 1, *Lady Lancaster*.—Bull calf by diseased sire; sold when twelve months old. Twice tested.

No. 2, *Madge Hamilton*; No. 3, *Bonny*.—Both had bull calves by diseased sire. Were twice tested, and were sold at about eleven months old.

No. 4, *Grand Duchess*.—Bull calf by sound sire. Tested twice, and sold at about five months old.

No. 5, *Lady Augusta*.—Heifer calf by sound sire. Twice tested as a calf and then tested as a yearling. Nos. 1, 21, 31, 4 and 5 all suckled a nurse cow.

No. 6, *Sittytton Verona*.—Heifer calf by sound sire.

No. 7, *Geanie Girl*.—Heifer calf by diseased sire.

No. 8, *Pine Grove Clipper*.—Heifer calf by diseased sire. Nos. 6, 7 and 8 were raised on sterilized milk. Tested twice as calves and again as yearlings.

No. 9, *Louise*.—Heifer calf by sound sire. Twice tested as a calf and also as a yearling. Fed on sterilized milk.

No. 10, *March Violet*.—Bull calf by sound sire. Died when three days old. Cause of death due to change of milk.

No. 11, *Darling*.—Bull calf got by sound sire. Died about three days old. Cause of death due to change of milk.

No. 12, *Mary Leslie*.—Heifer calf by diseased sire. Calf little premature and died about two days old.

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*No. 13, Minonette ; No. 14, Annie Leslie.*—These calves were got by unknown sires and suckled dams on pasture. Tested once at about five months old and were sold to butcher.

1899-1900.

*No. 1, Lady Lancaster.*—Heifer calf got by sound sire. Calved in September, 1899. Dam reacted in both tests.

*No. 2, Madge Hamilton.*—Heifer calf by sound sire. Calved in October, 1899. Dam reacted in both tests. Both these calves (Nos. 1 and 2) were suckled by nurse cows.

*No. 3, Bonny.*—Died. Cast in ditch.

*No. 4, Grand Duchess.*—Bull calf, sired by sound sire. Calved in September, 1899. Suckled dam. Dam showed no reaction in two last tests.

*No. 5, Lady Augusta.*—Calf died. Dam stood first test, but reacted in second.

*No. 6, Sittyton Verona.*—Not calved yet; reacted in both tests.

*No. 7, Geanie Girl.*—Bull calf by sound sire. Suckled by dam; calved in September, 1899; dam reacted in both tests.

*No. 8, Pine Grove Clipper.*—Heifer calf by sound sire; suckled by nurse cow. Dam stood the first test, but reacted in second; calved in November, 1899.

*No. 9, Louise.*—Was slaughtered.

*No. 10, March Violet.*—Heifer calf by sound sire; suckled dam; calved in September, 1899. Calf reacted in test. The dam reacted in both tests.

*No. 11, Darling.*—Bull calf by diseased sire; suckled dam; calved in October, 1899. Dam stood first test.

*No. 12, Mary Leslie.*—Bull calf sired by diseased sire; calved in September, 1899; suckled nurse cow. Dam reacted in both tests.

*No. 13, Minonette.*—Not bred last year. Stood first test.

*No. 14, Annie Leslie.*—Aborted. Dam reacted in both tests.

*No. 15, Mildred Sixth.*—Bull calf by diseased sire. Dam stood both tests. Calved in March

*No. 16, Amelia Leslie.*—Heifer calf by sound sire; suckled dam. Dam reacted in first test, but stood second; calved in September, 1899.

*No. 17, Canadian Rosebud.*—Bull calf by sound sire; suckled nurse cow. Dam reacted in both tests; calved in September, 1899.

*No. 18, Mildred Ninth.*—Heifer calf by sound sire. Dam stood both tests; calved in October, 1899.

*No. 1, Violet Second.*—Bull calf by sound sire; suckled dam three times, and then was put on nurse cow; reacted in test. Dam reacted in both tests; calved in February, 1900.

*No. 20, Canadian Rosebud Second.*—Bull calf by sound sire; suckled nurse cow; calved in February, 1900. Dam reacted in first test, but stood second.

*No. 21, Lady Lansdowne.*—Bull calf got by diseased sire; suckled by nurse cow; calved in February, 1900. Dam reacted in both tests.

*No. 22, Rose of Autumn.*—Heifer calf got by diseased sire; suckled nurse cow; dam reacted in both tests; calved in May, 1900.

*No. 23, Rose Bloom.*—Heifer calf by diseased sire; died in changing to nurse cow; dam stood both tests.

Prof. McEachran continued—

Now, gentlemen, before sitting down, if you will bear with me a moment, I will read a letter from Mr. Edwards to myself, in answer to some questions I asked him, which brings out some points I think it is necessary this committee should have. He says:—

‘I have seen nothing to lead me to believe that the tuberculin test has had any injurious influence on the course of the disease. It is by no means our opinion that the disease has been stimulated or aggravated by the application of the tuberculin test. All animals that we have tested two or three times continue as hale and hearty as they were previously, and not one animal in our herds has broken down or failed in any way since we began testing. I cannot say that we have proof that can

be relied upon to the effect that the use of tuberculin has checked the disease, but we will not be surprised if we find that in some instances it does. We retested twelve months later all the animals which at first reacted, and of the lot four made no response in the second test. One of the four animals was slaughtered this autumn and on the most careful examination made with the naked eye no trace of the disease could be found. We believe all the same that the disease was there. Since beginning the experiments here we have raised calves on nurse cows, and on sterilized milk, and not one of the calves so raised have responded in the slightest degree to the test; and all have been carefully tested. We have now gone so far as to turn grade calves on to the diseased cows in pasture and we also raised a grade calf on the milk of a diseased cow with the pail; each of those that sucked the diseased cow in pasture were tested, as well as the one fed from the pail, and none of them responded whatever to the test. We have learned a good deal from those experiments and when we are through you will be able to give Canada most valuable information on this subject. Meantime we will be glad if you will treat the whole matter confidentially. We do not think that the test is infallible, but we think it the safest present guide, and we are fully convinced that the honest use of it and a little care should stamp out tuberculosis anywhere. Close contact in confined and ill-lighted and ill-ventilated stables we are convinced is the great means of conveyance of the disease. We are now raising six fine bred calves on the dams, though they are entirely separated and only come together twice a day in open yards. Our belief is that this will prove a success. We are well convinced that the disease can be stamped out in Canada and the Canadians will act foolishly if they do not do it. Your truly,

‘W. C. EDWARDS.’

Now, gentlemen, I may say I visited Mr. Edwards' farm yesterday and was shown over the estate by him. Any lover of fine bred cattle could not enjoy a better day. The quality of the herd was a revelation to me, and these animals all in perfect health, and by this experiment so liberally conducted by Mr. Edwards in the public interest more than his own, and which you see was not supposed to be made public, but he has very generously allowed this matter to come before the Committee and the country so as to allow the country to benefit from a knowledge of the facts of the experiments, which would have cost the country a great deal of money if conducted by the department. I may say that at our station at Outremont experiments are being conducted in the same lines but on a small scale, because we cannot stand the expense. In the report of the minister you will find the reports on Outremont station, some of which you will find interesting as bringing out points not brought out in this report.

*By Mr. Sproule*

Q. Were the cattle subject to any treatment during the time they were in quarantine?

A. No.

Q. Then I understand that at the second and third tests made, six animals which had responded to the first test did not respond?

A. Yes, there were five.

Q. What conclusions would you draw, that they were cured?

A. Well, Prof. Nocard is firmly of opinion and states so boldly that many animals are cured. We often find that the disease is cured, and if taken in the early stages you will get a reaction from tuberculin, but in some cases the tubercle bacilli are killed by the tuberculin, but you will find a small percentage in which you will find it very difficult to discover where the tubercle is actually located.

Q. But would not you think that putting these animals under favourable conditions again it only requires in such case to develop it again that the bacilli may be lying latent in the system?

A. Possibly, but it is possible to contract the disease without that. In reference to the report of Dr. Higginson I think Mr. Edwards can give any information.

Q. Then if the bacilli were lying in a latent condition what evidence of its existence there is shown by the test then you take it they might be in that condition and the test not show any signs of tuberculosis?

A. If the tubercles had reached the stage when the tubercles had become calcified, as is often the case, you might not get a reaction. Another case in which you do not get reaction is when the animal is so badly diseased and the blood is so saturated with tuberculin the small quantity of tuberculin injected gives no reaction



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We have had cases where a cow has died in a few days after using tuberculin without reaction. So that tuberculin should be used only by very careful men. Therefore I think tuberculin should only be used under government supervision the same as other poisons.

Q. Do you think these experiments lasted long enough to get benefit from the work; only a year and a half; I think from the report the calves came about the end of 1898?

A. No.

Q. Suppose the calves were dropped in September, 1898, it is so close to 1899 that it only gives a year and a half.

Mr. EDWARDS—It is supposed to go on another year?

Mr. SPROULE—You might explain it to the committee now.

Mr. EDWARDS—If you will notice three slaughtered calves have gone through the test and come out satisfactorily. That seems to me a strongpoint. This experiment is going on for another year, but the Minister of Agriculture made the suggestion to me that he would like the public to get the benefit of this experiment as far as it has gone, and I consented to it coming before the Committee. That we can find out something more we expect, but we have already found out a great deal. As to results we ourselves feel perfectly satisfied, the experiment is quite sufficient for us, but I just want to state what the experiment is to be for the next year. We have purchased a number of nurse cows, all of which we have had served by thoroughbred bulls. All the calves are to be crossed next year, the calves of nurse cows to diseased cows and the calves of diseased cows to nurse cows, and we are going to carry on the experiment in that way.

*By Mr. Sproule:*

Q. Are the nurse cows tested too?

Mr. EDWARDS—I will just state here, Mr. Chairman and gentlemen, that no animal is allowed to come into our herd to-day until quarantined and tested. If we import cattle from Great Britain to-day, and we do, they do not mingle with the others for six months. We made an importation last year and we built new buildings to house that importation. The whole experiment has been carried out under the direction of Dr. McEachran by Dr. Higginson, the veterinary surgeon. I just want to state how the disease was discovered. We were going to export six bulls to Wisconsin and we asked for a test of these for exportation purposes, and there never was a man more thunderstruck than myself when I was told that tuberculosis existed among these cattle. You can understand how a man would be knocked down after he had been for twenty-five years building up this herd of horthorns. I supposed the whole would have to be destroyed. I spoke to Mr. Fisher and wrote to Professor Craig, of Wisconsin. He said the herd was too valuable to destroy; to follow the suggestion of Mr. Fisher. Everything has been carried out carefully and I think honestly. The report you have heard to-day can be vouched for in every respect. These six bulls we were going to export we did not sell to our fellow farmers—they were destroyed—and no animal was afterwards sold from the farm until the experiment had gone so far that we could sell with safety. The first bull sold after was in 1898 and sold to Senator Cochrane. We were satisfied as to its condition, but we said to Senator Cochrane's son to test him. Every animal hereafter sold shall be tested, and we shall not be one of those who are disseminating disease among the cattle of Canada. No matter how valuable, it shall not go out with any trace of disease. Every animal we sell we sell with confidence; every animal imported is brought in and kept in quarantine for six months.

Q. Is not every one of these tested in quarantine, and tested in quarantine on the other side by veterinarians whose standing is endorsed by the department here?

A. I would say to that, Mr. Chairman, that we are dealing with men and men, and so far as we are individually concerned we are going to examine ourselves.

Q. I ask does not the law provide for a test?

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A. I understand the regulations are as follows: That the Dominion Government does not take any responsibility. If importers wish to import I understand it is allowed that the inspection can take place on the other side by gentlemen whose names are accepted, and their examination is accepted for importation purposes. But as far as we are concerned we are going to make ourselves safe as regards the test. We have laid down the rule that our herd hereafter shall be tested twice a year, and no animal, no matter where it comes from, shall mingle with our herd until after six months.

*DR. McEACHRAN RECALLED.*

*By Mr. Sproule :*

Q. Then I understand that it is not necessary to apply the test here to cattle imported by regulations of the department; is that so, doctor?

A. The present practice is to accept the certificate of veterinary surgeons who were recommended by Prof. McCull, of Glasgow, the principal of the Royal Veterinary College in London, and the officers of the Board of Agriculture, and the letter that is written to them reads somewhat as follows: 'I would suggest to your Lordship, when application is made by an importer for the name of a veterinary surgeon, a letter be written to the veterinary surgeon from your office explaining this, and at the same time explaining that it does not mean any employment in the Canadian Government service, and that the cost will be paid by the person importing.'

Q. Then I understand the regulations do not exact the tuberculin test in quarantine here?

A. No.

MR. FISHER—Not when they have a certificate from one of these men.

*By Mr. Edwards :*

Q. Have not the tables to be sent over from the other side, doctor?

A. Yes, the charts have to be sent over with the cattle and we have to approve of them. In some cases we do not approve of them.

*By the Chairman :*

Q. You would not suggest using diseased male animals with healthy cows?

A. No, not let them within miles of them.

*By Mr. Rutherford :*

Q. There is one important point touched on this morning, that is the curing of the disease. I think there has been a wrong impression left on the minds of the Committee by a little cross-firing between Dr. Sproule and yourself. Dr. Sproule suggested that if, as you say, the bacilli was in a latent condition—he used the words when you said you had no doubt the bacilli died and became absorbed—and he suggested that if again placed in unsanitary surroundings the disease would break out again. Now, that point wants to be cleared up; if the bacilli is dead, it would not matter what the surroundings were unless there was fresh infection?

A. It would not require to have the disease previously; any animal that is exposed to such conditions would take it.

Q. The point is whether, having had the disease, it would necessarily break out again?

A. Not at all.

*By Mr. Edwards :*

Q. It would simply be more predisposed?

A. No; there must be disinfection of the premises.

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*By Mr. Featherston :*

- Q. How long has Professor Bang's system been in practice?  
 A. About eight years.  
 Q. What is the result?  
 A. Perfectly satisfactory.  
 Q. In some cases we see it only break out in younger animals?  
 A. Occasionally.  
 Q. Just as satisfactory as ordinary breeding?  
 A. Yes.

*By the Chairman :*

- Q. How long, as a rule, is the animal affected after the test?  
 A. The effect produced by the test?  
 Q. Yes?  
 A. Oh, it goes down within 24 hours; in fact, 12 hours.  
 Q. Would it be perfectly safe to apply the test again in one month?  
 A. No; three months.

Mr. RODDICK, Mr. Chairman and Gentlemen, I am sure we have all listened with great interest to the report which Dr. McEachran has made and to Dr. Higginson's report, and I think the thanks of the whole farming and dairying community is due to Mr. Edwards for the work he has made it possible to do under these circumstances. He has made it possible to prove by the experiments which have taken place on his farm that Bang is in the right direction. There are one or two things which might be explained and which I will ask Dr. McEachran to explain. It seems that three cows which were healthy became reacting. That is remarkable to me, considering the surroundings were made in perfect condition, that these seven animals were found perfectly healthy and subsequently, when a test was again made, three of these seven were found to be diseased. That surprises me a little and I cannot explain it to myself, considering you had the surroundings so thoroughly disinfected that it was impossible for these animals to contract the disease from the mangers, from water or from other animals. It shows that the tuberculin test may be a little fallacious in some cases. I don't know how you will explain it, but it shows that one may not take it for granted always that this shall be perfectly true in its results, and that probably earlier tests than those made might be made in some cases, that the tuberculin itself may vary very much or the effects of the tuberculin may vary or the parties may not be careful. These are points which cropped up in my mind, but altogether I think the results are satisfactory, and if it can be proved that cattle can be rid of the disease in this way of course it will be very much less expensive than the process elsewhere and which is recommended for this country, that is the destroying of herds. This is not all a desirable thing, in fact it will lead to a great deal of trouble and mischief. However, I think myself with this plan of Bang's very much may be done now and immediately. I think if the Dominion Government and Parliament will come forward at this moment and assist the little island of Prince Edward in the scheme they are about to develop, it would be doing good. They are anxious to begin a scheme, and I understand they have already the bill before their legislature which prevents the introduction into that island of animals diseased and provides for the slaughtering of animals clinically diseased, which, as Dr. McEachran says, means animals very much diseased, —and which can be discovered by the stethoscope—the grosser forms of tuberculosis. The milder cases are those which can only be detected by the tuberculin test. If the Government would aid Prince Edward you would there have the nucleus of a great scheme. You would have Prince Edward Island freed from the disease in a reasonably short time, and from that island could be drafted healthy animals in a short time. You could then begin by cutting off a portion of Nova Scotia, or beginning from the other end and cutting off a portion of British Columbia, and we would then have a healthy Canada in a few years.



*By Mr. Sproule:*

Q. You mean turning it into a breeding station?

A. Yes; all these points would have to be attended to. You would find all the breeders in the world would come to Canada for their breeding cattle. The expense might be great, but it would repay the Government of Canada and of any province which is willing to take it up. I quite agree with Dr. Rutherford and Dr. Sproule that these tests should be continued a little while longer, and that what is going to be done on Mr. Edwards' farm should be carried out, that of transferring diseased calves to healthy cows and vice versa. That would take some time, but will be a useful experiment.

The CHAIRMAN—I would ask the leader of the opposition, whom I see present, to say a few words on this matter.

Sir CHARLES TUPPER—I would like to say a single word on this important question. I would thank Mr. Edwards for letting me know it was to be brought up here this morning. I listened with intense satisfaction to everything that has taken place. I agree with Dr. Roddick that the entire community and the cattle holders of Canada are greatly indebted to Mr. Edwards for carrying out under the very able superintendence of Dr. McEachran and Dr. Higginson, the veterinary surgeons, these experiments, but I think we may go further and say that the whole population of Canada have a most deep and vital interest in this question. It is known that tuberculosis practically represents consumption in the human family, and it is known that for a long time and until a recent period the terrible fear that consumption must follow from heredity, and that the children of a consumptive mother must, in the ordinary condition of things, look forward to being attacked by the same disease, was prevalent amongst us. This is a question of supreme importance, not only from the agricultural point of view, but from the point of view of human activities, and if this should be proved as appears so far as these experiments are concerned, as far at least as I have followed them, if it can be proved that the calves of cows suffering from tuberculosis can be removed from the mother and being sucked by healthy animals, can be protected absolutely from the disease, it, to a very large extent, goes to establish the fact that we need not dread as we have dreaded the hereditary tendency to consumption in the human family. It means that by proper exertion, by following out systematically this means of dealing with tuberculosis we can look forward at no distant date to having the whole Dominion free from this disease, that is so wide spread and deeply laid that to deal with it, as pluro-pneumonia has been dealt with, is absolutely impracticable. The enormous cost of sacrificing all the herds where tuberculosis has been found, as has been necessary for pluro-pneumonia, would, from the wide extent of the disease, render it practically impossible to accomplish the object with regard to tuberculosis. But under these experiments carried out with so much care, which really appears to me that vigorously followed up, that system which is so well established, although as you say it has not been proved, that the opinion of some has been taken that inoculation by tuberculin gives absolute immunity. If it gives 18 per cent it gives so small an extent of disease as to lead to the expectation that ultimately you will practically relieve the country from the presence of tuberculosis.

I think under these circumstances we are all greatly indebted to Mr. Edwards, who has, under the wise and skillful direction of Dr. McEachran and his associate, Mr. Higginson, carried out these experiments. And I believe what has been stated to the Committee fully with reference to the hope that by following up the experiments throughout the country, we may hope at no distant day to find Canada free from tuberculosis, and the value of that to Canada cannot be overestimated. Let it be fully understood that not only is Canada free from pluro-pneumonia as we all know, but that there is a country where the cattle can be relied on as absolutely free from tuberculosis, you would give a value to the thoroughbred stock beyond calculation. After listening attentively to what has taken place, I would fail in what I deem to

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be my duty if I didn't express the thanks of the country for the work that has been done.

MR. EDWARDS—I don't wish to take up the time of the Committee, but I want to say a word, if I may be allowed, in answer to Dr. Roddick. It is coming from a layman, but there may be some force in it. Dr. Roddick refers to the three cows which did not react on the first test but reacted on the second. I just want to point this out. The rule laid down by the scientists, in so far as this matter is concerned, that unless the temperature rises two degrees the animal is not condemned. In the animals at our place, we haven't confined ourselves to the limit by any means, but if the slightest suspicion exists, the animal is set aside. Now, I haven't the slightest doubt that there are animals set aside at our place on the first test that had no trace of a disease. If an animal is a highly nervous animal the response may be quicker, and another thing, animals that are in heat or are nearly in heat, react more readily, and if there is any reaction, we reject them, so that probably animals are set aside that are not diseased. That may be possible.

MR. RODDICK—Excuse me, but these are found not to react.

MR. EDWARDS—In the first test the three cows that did not react, did react in the second. In the second test seven cows reacted that did not react in the first. I am dealing with the seven now, not the three. These seven cows which did react in the first, did not react in the second. Now, there is something that came out in Ontario—in Guelph, and perhaps Prof. Robertson, here present, can tell us about that. Some animals were slaughtered there, and it was found that the diseased parts were incised afterwards that was discovered. Now, there may be that curative effect, because, mind you, this seven is not a broken down herd at all. It is a very healthy looking herd, indeed. Now, then, as to the three which reacted in the second and did not in the first. I am speaking as a layman, but remember they were in the premises where there had been so many diseased animals; the infection may not have been absolutely removed in the first cleansing. Little traces, slight traces might remain in some part of it, and that would have an effect on the animals afterwards. That may be possible. Now, another thing, as far as that is concerned—I am not a professional man—but might not the disease just be beginning, or might it not have got far enough to cause a reaction. Really this should be perpetuated. I think if it is further looked into by such men as Dr. Roddick and other professional men, these little matters will find room for explanation.

*By Mr. Cargill:*

Q. In testing a bunch of cattle do you find on the test a number of them reacted and a number of them did not, and that upon a subsequent test those which reacted at the first test did not respond and those which did not respond at the first test did react?

A. That is specifically stated.

MR. CARGILL--That being the case I would infer that the tuberculin test is of no value.

MR. EDWARDS—Now, Mr. Chairman, I place great value on it, I have seen enough to thoroughly satisfy me. Dr. Higginson's test does not say it is not valuable. He says the test is generally correct. I have been trying to explain that very thing. I would make two suggestions; one is that I would invite this Committee to come down and examine the herd and examine the whole condition to see what has been done and I will take them down and take them back with pleasure. I make another suggestion. This is perhaps a very expensive one, but perhaps the Dominion Government can do something after we have done so much, because in this matter we have carried it on at our own expense and don't get one cent on it. The Government pay their officer but there is no compensation so far as we are concerned. Here would be a great feature. Suppose next year the calves are crossed, and you take a certain number of these and have the best bacteriologist and have a thorough scientific dissection and examination and then get the results. That would be worth many, many thousands of dollars.



*By Mr. Ferguson :*

Q. Had you any evidence at the beginning of this that your herd was in a diseased condition, except the tuberculin test ?

A. None. I venture to say there is not to-day in the world a more healthy looking herd than our herd. Not one animal has broken down since. I say further it could not have been discovered except perhaps by very careful examination with a stethoscope if such could be done, it could not be discovered without the tuberculin. Is there any other way in the world that is known of; if there is I have yet to hear of it, that has proved to be successful at the present time,

Mr. RUTHERFORD—I think with others that this experiment is one of the most valuable not only to Canada but to the world that has ever been attempted with regard to tuberculosis. Of course we know that since 1882, Professor Bangs has been operating on the same lines, but even in his experiments the same variety has not been introduced as in the experiment now going on down the river here. There are a few points which I noted down here on which I would like to speak with a view perhaps of eliciting a little more information and eliminating or lessening the element of danger which I see if this report is allowed to go out to the public without comment. The first is with regard to Mr. Sproule's remarks, namely, the effect of the tuberculin test in curing the disease. I have been using tuberculin ever since it first began to be used in 1888 in testing cattle and I have come to the conclusion without having any direct proof of it, as I do not think any direct proof exists in the world to-day, but I have come to the conclusion that in mild cases of disease the repeated use of the test has a curative effect, but I cannot prove that, and as such it is a most dangerous doctrine to promulgate among the farming community and I think that should be stated so that people will not go away from this Committee or read the report and carry away the idea that the tuberculin test is a cure for the bovine tuberculosis.

Sir CHARLES TUPPER—Its great value is as a diagnosis.

Mr. RUTHERFORD—I think there is no question about that and when we have the highest authorities in the world acknowledging it it is too late in the world to throw doubts upon it.

In regard to the suggestion made by Mr. Edwards and endorsed by Dr. Roddick as to the possibility of having this test still further carried on by slaughter and a careful examination, I cannot say too much in its favour. I think probably that would be the most valuable experiment in regard to the treatment of tuberculosis in Canada that has ever been attempted in the world and I think the Government should certainly give every assistance in its power to the carrying out of this test. It would be better perhaps if it was done on cheaper cattle than the majority of those on Mr. Edwards' farm.

As regards these three cows I want to dwell on the danger of allowing tuberculin in the hands of non-professional men. I think the Government of Ontario made a great mistake when they sent out a man named McRae to educate the farmers in the application of the tuberculin tests, because it is a well known fact that an animal suffering from it tested once, and retested subsequently will not respond in anything like the same degree to the tests. An unprincipled farmer or stock breeder, because there are such in the world, who finds that he has tuberculosis in his herd, by using the tests himself repeatedly will be able to render his animals immune, and will be able to sell diseased animals, male or female, to people in various countries or to his next door neighbour and submit to the test and there will be no reaction, and I consider that to be one of the most dangerous things I ever saw.

Mr. CARGILL—That just establishes the fact that tuberculin is a cure.

Mr. RUTHERFORD—Not at all. This fact has been demonstrated, that while in mild cases there might be doubts as to whether it was curable or not, this fact is well understood, that in a bad case of tuberculosis while the animal may react on the first test it may not react on the second or third test. But that must not be regarded as a cure.



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With regard to the three cows that did not react on the first test, I agree with Mr. Edwards that perhaps at the time the first test was made, the disease in these cows was in a period of incubation, that the disease was just taking hold and these did not react. It was quite possible that the other suggestion of Mr. Edwards that some of the bacilli had been lurking in a corner of the building or some place where these cattle were exposed to the contagion explains the matter.

Now, there is another danger. The next danger which I see is the danger of accepting without question the report as to the advisability of allowing calves to suckle diseased cows. I do not believe in that at all, for this reason: that once you admit the principle of allowing calves to suckle diseased cows, you might as well throw open the doors, and allow children to take the milk from these cows. The principle is the same. I admit that in a very large percentage of cases of bovine tuberculosis as well as in cases of human tuberculosis, milk will contain no bacilli, but how are you or I or any other ordinary farmer going to tell the exact moment in which the bacilli will enter the blood stream and become transmitted to the milk? Or, how can you tell which one out of eighteen or twenty cows have bacilli in the milk?

Mr. EDWARDS—My own personal view is this: that if the breeders of Canada would go to work and stamp out the disease entirely, the disease will soon cease in Canada. I think it comes generally in thoroughbred herds, and does not prevail to a large extent among grade cattle, and if breeders will be honest to themselves and to the country, we will have no bulls distributing this disease around. I admit that if this is carried out to the full all over the country it will be a very dangerous thing, but surely the breeder could take care of it. Of all the cows that we have purchased antedated, we haven't had one that we bought in the country respond to the test. Every one of them has proved perfectly sound.

Mr. RUTHERFORD—I would call attention to the fact that a few years ago wherever we found Bow Park cattle we found tuberculosis, among the ordinary cattle, and Bow Park which was looked upon as one of the greatest benefits to the farming community in Western Canada was really a danger, because they disseminated tuberculosis among the ordinary farmers' herds. But nowadays, English importers are paying very much more attention to hygiene than in the earlier days, their stables are better ventilated and lighted and the conditions are better for the prevention of tuberculosis than they were then. We found that the greatest source of danger exists among dairy cows which are kept for milking purposes, and these would not be affected by any action on the part of the breeders to any great extent.

Mr. EDWARDS—These dairy cows do not suckle calves.

Mr. RUTHERFORD—No; but they suckle children, and if you say it is safe for the calf to suckle that cow, you say its milk is fit for children, you can't get away from it. All the experiments that Professor Bang has made have been made with sterilized milk, heused that milk alone. It is an exceedingly dangerous doctrine to preach to the people of Canada, that it is safe under any circumstances to use milk from tuberculosis cows, because although there may be a large percentage of cows that is quite safe, there may be one or two that are dangerous animals, and you can't tell what day they become dangerous.

Mr. CARGILL—I think that is an important point you have brought out, that tuberculosis prevails to a larger extent among dairy cows than what is supposed.

A. Statistics go to prove that consumption in the human family comes with the dairy cows.

Mr. McLENNAN (Inverness) In the Maritime Provinces, there is a tribe of that have not had the advantage of milk or the flesh of the cow, and that have not had the benefit of that, but they are dying off with consumption.

Mr. RUTHERFORD—The Indians in the North-west are dying off in considerable numbers with tuberculosis, and it was unknown among them until the advent of the white man and the dairy cow. It was unknown in Australia until the cow went there; it is unknown in China, because the Chinese do not use milk and butter, it is unknown in the steeps of Central Asia, and in Egypt, because the Fellaheen do not use the dairy cow, and although thousands of Europeans have gone into Egypt for treatment for the disease they have remained immuned.

By AN HON. MEMBER—Before they had seen a dairy cow or milk, the Indians in the Maritime Provinces had tuberculosis.

A. Contagion will come from the human being as well as from the cow, and I do not for one moment maintain it is the only source of contagion, but that it is a very common source of contagion. The conditions under which the Indians live are exceedingly favourable to the spread of the disease in all parts of Canada.

In regard to the reliability of the test, I have always felt that the greatest care should be exercised as to the test itself. I would not give you the snap of my finger for a certificate of the test unless I knew the man who made it, and knew him to be a man of high standing, because there are so many little circumstances that occur in regard to the administration of the test, so many opportunities for carelessness and unreliability, that I do not place any value whatever upon a test certificate, unless I know the man well, or know well of the man.

*By Mr. Cargill :*

Q. What do you think of certificates from these Professors in Scotland? Would you consider them reliable?

A. I would like to know them.

Mr. SPROULE—There are some reliable Scotchmen.

Mr. RUTHERFORD—Yes, and some very unreliable Scotchmen, and Irishmen, too. In regard to ridding Canada of tuberculosis, I would like to see it, but I think it is a little bigger contract than we have been led to consider from some of the remarks made to-day. It would be a very difficult matter to rid Canada of the disease.

*By Mr. Edwards :*

Q. Wouldn't you like to try it in Prince Island?

A. Yes; I think it is well worth trying, but if you have removed every case of tuberculosis animal from that island, as long as you have consumptive men and women going through the stables, you will not get rid of the disease; because as long as a human being can contract the disease from a cow, they also may contract it from a human being.

Mr. DOUGLAS—I have the impression, whether I am correct or not, that consumption perhaps is very prevalent, more prevalent in one part of Canada than in another. I refer to people residing within say five miles of our Great Lakes, and I have noticed the disease very prevalent there, say on the shore of Lake Ontario. It may be a point for the scientists who are here to-day discussing this subject to consider whether the disease is equally prevalent amongst the cattle within a radius of five miles along the shores of the lake, Lake Ontario or the other great bodies of fresh water. If it can be established and shown that it is equally prevalent amongst the stock as consumption is in the human family, then I should have a great deal more confidence in the statements that have been made here to-day; but that is a point I think that is worth investigating and considering, and I think perhaps some light may be thrown upon it.

Mr. SPROULE—I just want to say a word too with regard to these statements. To begin with I think they are most valuable and in the right direction, but I don't

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think they have been continued long enough to make absolute data upon which we may rely to draw our conclusions. There is another question—that repeated applications of the test leave the animal which receives them so that it won't react, and from any clinical observations there is no evidence that we can find a trace of the disease. What is it in the animal anatomy that makes it not react? Either that the application has cured the disease or that the test is not by any means infallible, even to the extent of 98 per cent. It seems to me that is the only conclusion you can come to. If it is a remedy that cures the disease, that is the very thing we would like to get; but I think that is yet to be proved.

Now, besides that, if we for instance use a quarantine station like Prince Edward Island, and use it as well for a breeding station, we can eradicate the disease and cure the disease; but is it not a fact that if we take the herd where there is no evidence of the existence of the disease by any means at our disposal to ascertain, that if you put such a herd in unsanitary stables and under unsanitary conditions it will develop, it must have an origin, it shows as well that you may eradicate it, but if you don't keep the sanitary conditions it is quite as likely to break out in these localities. There are two things that should attract our attention. The first is: Are our regulations which we have devised for the purpose of preventing the importation of animals affected by tuberculosis effective or are they not. Mr. Edwards says that it is these cattle when they come out bring it. They have come in on the strength of some certificate from a surgeon in England or Scotland. If that is not sufficient, I have always heard that it is the duty of the government to apply the test on cattle while in quarantine in order to see that it is not imported. What is the result? I will take the case of Mr. Edwards, he is only one of forty or fifty importers, and the result will be that it will be of benefit to him, but it becomes a rather doubtful business, and the Government should step in and provide some regulations that apply a test which would be regarded as an absolutely safe one to guarantee. Another inference is that animals that are fed upon milk that is not affected for the time but came from an infected cow, still the disease must be communicated from one to the other. That suggests a very valuable remedy for us in connection with the dairy stables of our country. And what is it? It is the sterilization of all milk; you can do that, and it is not an expensive thing to do. It suggests the advisability of so changing the law as to compel this to be done. Let the company who is collecting milk for distribution be compelled to sterilize every gallon of it or every quart that they sell to the people of the country; where it is treated in that way it becomes quite innocuous. I think that this suggestion, as the outcome of this, would be very valuable if acted upon, and I may say in connection with that, that I realize to the fullest extent the value of the experiments being made by Dr. McEachran and Dr. Higginson with these cattle of Mr. Edwards, and I think Mr. Edwards is deserving of great credit for the pains and the expense he has gone to to demonstrate that; but the experiments to be made yet will be of great value. I recognize the value of slaughtering diseased animals and destroying them, but the urine and faeces and sputa ought to be tested, because even after you have slaughtered them you may find that in some of the organs the bacilli may be there though they escape observation.

*MR. EDWARDS RECALLED.*

*By Mr. Roddick :*

Q. Mr. Edwards, you were asked whether your animals did not look remarkably well before the test was made, and when you were about to sell them; and you said they were in apparent perfect health; but did you have the six subsequently slaughtered and examined for bacteriological signs of the disease?

A. No, they were only examined by the veterinary; but every one showed traces of the disease.



*By Mr. Featherston :*

Q. After slaughtering?

A. Yes.

*By Mr. Rogers :*

Q. What symptoms did they show?

A. Well, if you have breaking down animals in your herd you will see it; but as far as this herd is concerned their outward appearance would not lead you to believe it.

Q. They were under special conditions?

A. Dr. McEachran described that because ours were not breaking down. To-day I think it is most valuable to go down and see them.

*By Mr. Bell (Pictou) :*

Q. What did you do with those animals who were tested and did not react?

A. They are still there; we did not return any.

THE CHAIRMAN—Perhaps Professor Robertson would like to say a word.

PROF. JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying.—I would just add a word to the most useful and most important information given to the Committee and the country. If we are not yet in possession of knowledge to say how the disease can be stamped out, we do know many ways whereby the disease can be abated greatly, and to a great extent Professor Bang's work in Denmark is doing that in several ways. I may say that when in England lately I found the health authorities were making bacteriological examinations of butter to prevent the importation of butter from diseased cows, and the Danes proclaim everywhere that Bang's system is preventing disease in the herds and that their dairy products should be considered perfect. Now ours has been examined and found good. We have a good name, and we should keep it. We can, by taking every reasonable step to prevent this terrible disease. One of the means is this: In Denmark they have a law that all skim milk from the creameries must be sterilized before going back to the farmers, lest the disease from one herd may be brought to another. They have a law providing that all the gummy substance taken out of the milk in the separator must be destroyed, and there is a heavy penalty for neglect to do so.

*By Mr. Featherston :*

Q. I suppose the milk is used for feeding calves?

A. Yes, and they go on the line of greatest safety ever where there is not complete knowledge. They go on the principle of keeping the stables light. While tuberculin may have a curative effect, experiments were tried here and in these cases the tuberculin treatment did not cure the disease.

*By Mr. Edwards :*

Q. At Guelph?

A. At Guelph and at Ottawa: but a preventive and perhaps curative condition may be created and one means to that is abundance of sunlight. Physicians now are of opinion that tuberculosis is a house disease and not one of heredity,—not so much in the family as continued in the family through their surroundings; and want of light keeps the germs vital. In Scotland, where they are remarkably free from this disease, they have a practice of whitewashing the stables twice a year. Not only is whitewash a germicide but it reflects the sunlight. In Scotland this treatment has kept the disease away in large measure and if our farmers would whitewash their stables inside, for the sake of the looks, for the sake of the cattle and for the sake of the people, it would be a valuable aid to progress. I am glad to hear this subject dis-

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cussed to-day showing how we can prevent this disease. It is very helpful and we should encourage our people to sterilize skim-milk from creameries and keep the stables light.

*By Mr. Featherston :*

Q. Mr. Douglas questioned with reference to animals living all along in the byre; have you noticed that practice?

A. Excepting this, that in some districts people keep shutters on their houses all the year. If you follow the lake you will find green shutters everywhere. I have a horror of cattle in dark stables. Let us know that abundance of sunlight is one of the most efficient allies in fighting this disease.

MR. CARGILL—Mr. Chairman, being somewhat interested in the importation of cattle, I just rise to say that I have been delighted with the discussion which has taken place here to-day. I think valuable information has been given to the Committee, by Dr. McEachran, through these valuable reports. I also think Mr. Edwards is entitled to a great deal of credit for prosecuting the experiments he has at his own expense in connection with this herd of cattle. My own individual opinion is that tuberculosis has existed for a great many years in the animal race, probably to the same extent as in the human race. As population increases, I think this disease increases, not only in the human race but in the animal race, and the more cattle are imported into this country, if the disease exists in the old country—and I was glad to hear Prof. Robertson say the existence of the disease in Scotland, from which most of our Short-horn cattle are imported, is very slight; we find the best of our Short-horns come from there, and for that reason we importers, who are anxious to build up our herds, go to the best place. I don't, for the life of me, see how this government could take any other precautions to guarantee and secure the importer, than the arrangements which now exist to safeguard the importer. I understand the Minister of Agriculture here has put himself in communication with responsible professional men at the head of institutions in the old country who have recommended several gentlemen there, probably well known graduates of these institutions, to test these cattle. Now, I go over to Scotland a perfect stranger; I go around and examine the different herds for the purpose of making a selection and buying some cattle. I stipulate, of course, having fixed the price, that these cattle must stand the test or I won't take them. Now, relying on the honesty of these veterinarians over there, I have these cattle tested. They give me a certificate of good health, and I am at once assured that I am taking no risk at all. I buy these cattle in good faith; bring them over here; they are quarantined at Quebec for ninety days from the date of shipment in Scotland. There is a doctor there at the quarantine stables—I don't know what his duties are, but he is supposed to visit these cattle daily. As to whether he examines them as to whether they are diseased in any way, I don't know; but we bring these cattle home. We take it for granted they are perfectly sound and free from tuberculosis. Now, I might say that every one cannot go to the trouble which Mr. Edwards has taken, a millionaire lumberman—

MR. EDWARDS—Oh, no.

MR. CARGILL—A man with lots of money can afford to make these experiments. You and I, Mr. Chairman, as farmers, know we cannot go to the expense of making these experiments. There are men engaged in the business of importing who go over to Scotland and import half a dozen cattle for their own special purposes, for breeding purposes, and if they have no guarantee that tuberculin is a safe test, and that on the certificate of the veterinary over there they can import these half dozen cattle, I think it would mean the cessation of importing cattle into this country, because no man in this country would take these chances. And as having imported some cattle we are very particular. We have found some people there who had very desirable animals that we would particularly like to have, but after making arrangements as to price we proposed the test. Well in a few cases we have been

refused and of course we have been unable to buy the animals for the reason that they would not submit to the test, and from the demand that there is in the old country at the present time for this class of cattle they are perfectly independent. There, in fact, the most important breeders until very recently would not submit to the test at all.

MR. RODDICK—Take your own veterinary surgeon with you.

MR. CARGILL—His certificate would not pass there at all. There is a kind of contradiction of terms here. I was very much impressed with the remarks of Dr. Rutherford here and he is a practical man. That is all very good indeed. There seems to be a divergence of opinion in his views and some of the other views expressed here. However, I don't want this committee to go away with the impression that my criticisms mean that I am finding fault with the work done here to-day. It is not my intention; I think it is commendable, very commendable on the part of Mr. Edwards, and I do him credit for it. But all the importers are not in the same position.

The CHAIRMAN—It has gone abroad throughout the length and breadth of Ontario, and as I find that there are differences of opinion as to the test, I would like the opinion of those who have spoken upon this article which was published in the *Sun* on February 28, 1900. Because if these statements made here to-day are to go out it is only fair that this should be discussed.

The article reads:—

'It is interesting to note that there is among experts a reaction against the popular belief that there is danger of tuberculosis in cattle being communicated to man. Dr. Theobald Smith, of Harvard University, who has been experimenting in this matter for some years, declares that human and bovine tubercule bacilli are not identical. He has joined in a recommendation to the New York Assembly that hereafter the state only force the condemnation, quarantine and slaughter of such animals, as are found to be tuberculous by physical examination. It would appear, he says, that seldom or never does a person contract tuberculosis from meat or the milk of animals, and it is recommended that the state can better use its funds in educational work than in following the present policy of destroying all animals showing a reaction under the tuberculin test. There is evidence that where cattle tuberculosis is plentiful, human tuberculosis is so rare as to have no relation to it. These statements, though not positive enough to be conclusive, are yet reassuring, not only to cattle owners, but to the general public which was seriously alarmed at the danger suggested by the tuberculin test.'

MR. RODDICK—I happen to know of the experiments of Dr. Smith and the man who makes that statement has read them incorrectly. I mean he has misunderstood the statement that Dr. Smith made. They were to the effect that the tubercule bacillus is changed or modified in its natural history by the surroundings. That you have a special human bacillus, that in the bovine bacillus differs in some marked respects in its nature, from the avian and other forms than those and it is found that the avian especially changed greatly. One of Dr. Smith's experiments was this: He took the tubercule bacillus and inclosed it in a gelatine capsul. He introduced these underneath the skin of a bird several of them of course, and he found these bacilli originally human in all their characteristics changed considerably in the body of the bird and become the ordinary avian bacillus and by putting human sputum in a glass case with a number of small fish, the fish took ill and became after a time tubercular and there they had changed and could stand the temperature of water or the low temperature of the fish itself. That is a sample of the change in the character of the tubercule bacillus due to its peculiar surroundings, and that is practically the same thing, and the bovine bacillus changes into the human as soon as it is in the human body.

#### DR. McEACHRAN RECALLED.

Most of you are aware that we have an experiment station in Outremont, where experiments are carried on in most diseases, particularly tuberculosis, and if you



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refer to the blue books of the Department of Agriculture for the last few years, you will find a good many of these points brought out in these reports. Last year two healthy heifers were inoculated one with bovine tubercule in the right lung the other with human in the left. The former died from extensive generalized tuberculosis on the forty-second day, whereas the latter (inoculated with human tubercule) although she contracted the disease showed slight clinical evidence.

Five guinea pigs inoculated with bovine cultures died respectively on the 14th, 15th and 35th days.

Three in which human cultures were used died in 18, 23 and 36 days respectively, generalized tuberculosis being found in each case. In rabbits five inoculated with bovine cultures died in 36, 70, 74 and 90 days, one surviving three and a half months.

Of three inoculated with human tubercule one only contracted the disease dying in 52 days the other being alive after two months.

This goes to prove what Dr. Theobald Smith has been working at for some years, which I stated at the outset of my remarks this morning that the diseases are analogous but not identical, and I find that by bovine inoculation the results are far more violent than from human tubercule so that the point is clear enough.

While I am on my feet I would like to make some explanation with reference to a subject discussed here particularly by Mr. Cargill, that is the action of the Government with reference to cattle imported from Great Britain. For a great many years since we knew the use of tuberculin on cattle, all cattle that came to the quarantine of Canada, before leaving quarantine were subject to the tuberculin test. Three years ago a number of the Ontario breeders, waited on The Minister of Agriculture and begged him to adopt the system now in vogue, that is of taking a certificate from selected men that is men selected by myself and officers of the Board of Agriculture of Great Britain, and these are the men whose certificates we taken urging as a plea, that the testing in Canada was deterring people from importing into Ontario.

Dr. Rutherford said something about dishonest farmers and they are not all confined to Canada. I think you will find the Canadian farmer does not require that description so much as on the other side even in the country from which Dr. Rutherford and I come. It is now known that if tuberculin is injected into an animal subsequent tests are not to be relied on unless three months have elapsed.

I wish you would read these reports of the Outremont station, you will find them very interesting. In the reports of Dr. Adami and Dr. Higginson and others, you will find it stated that we cannot rely on the test unless three months have elapsed. Now we may employ the most reliable man in Great Britain to do this test whose testing in perfect, but if this honest farmer has pumped in a little tubercule two or three days or 24 hours, before he arrives he gets no reaction but relies on his test and issues his certificate accordingly and he and all concerned are deceived.

Listen to this, this is from the report of 1897-8 in which I say :—

‘The alarming prevalence of the disease in Britain, France, Germany and Denmark ought to be a warning to Canadian breeders to be extremely careful not to import tuberculous animals, and as they can rely on tuberculin, if honestly used, to discover the disease in nearly a hundred per cent of cases, there is no excuse for their neglecting the test. I feel it my duty, however, to advise them to study testing themselves and see that reliable tuberculin only is used, and that the test is made as directed in the official bulletins issued by the department, and on no account to buy an animal without a test having been made.

‘Our experience at the Point Levis cattle quarantine of the results of testing by British veterinarians has been most unfortunate. In the case of one unfortunate importer, who obtained a veterinary chart and certificate of freedom from tuberculosis, the herd was tested again in Canada.’

Simply because I did not like the chart. The chart itself was condemnatory and I refused to accept it. Correspondence took place between us and I insisted on it being re-tested, and in the meantime a cow died from general tuberculosis.

*By Mr. Cargill :*

Q. Was the certificate defective?

### A. It led me to be suspicious, at all events.

Eight weeks after, they were slaughtered, with the result that 13 out of the 14 were found to be tuberculous—one cow being so far advanced with the disease that she died in quarantine from it, and on post mortem examination exhibited very extensive general tuberculosis. It is impossible to estimate the damage and losses that might have followed if this herd had been released from quarantine and dispersed one here, one there, into perhaps a dozen or more healthy herds, or, in other words, it would be difficult to compute the saving to Canadian live stock interests by the testing at Point Levis of this one herd.

I need not take up your time further ; I refer you to these reports.

The United States government is taking this matter up. In 1897, when the arrangement was made between the Minister of Agriculture and the Secretary of Agriculture by which quarantines were removed between two countries, it was clearly understood that testing of animals for tuberculosis was to be carried on on the same lines in both countries. We Canadians tested all the cattle arriving from the British ports. The United States authorities did not ; some of our importers made a complaint that they could import by the United States without having their cattle tested again, and it was subsequently urged so strongly on the minister that he adopted the system now in vogue. Now, the Americans have come round, and I had a letter a short time ago in which the complaint was made that we are allowing cattle to land without testing them, and pointing out that they insist upon cattle being tested now at their quarantine, and asking us if we will not test our own cattle, that we will not allow any cattle destined for the United States to leave quarantine without being tested. A gentleman called upon me the other day who was on his way to Britain to buy cattle for the United States. I notified him that they would be tested before leaving the quarantine to which he raised no objections whatever.

*By Mr. Cargill :*

Q. In case of cattle being sold to the United States, don't they have to test them ?

A. If they are going from here they have to be tested.

MR. CARGILL—In Canada here we test all our animals when they are sold.

DR. McEACHRAN—I may say that this is not the only instance I could give you of a similar occurrence in that quarantine where cattle have arrived with charts declaring that they were free from tuberculosis ; we have had animals passed through that quarantine and die within a year from tuberculosis, and I think it is placing myself as the responsible officer in a position I should not be placed in, in obliging me to allow animals to pass through that quarantine without allowing me to use my knowledge to find out whether they are diseased or not. Whether I am doing so rightly or wrongly, I maintain that the sooner we go back to the original way of testing every animal in quarantine the better ; on these grounds, in the first place, mistakes may take place in testing, and if a man has a herd such as Mr. Edwards has, he cannot afford to take any chances whatever. We have proved conclusively that the test of tuberculin does no harm whatever, it does not cost the owner a cent to have it done, in quarantine, and why should he refuse to get this further guarantee that he is not introducing it into his herd. I am very glad that this subject came up, incidentally, but in view of the fact that it was a departmental order I did not think that I should bring it up, but I am very glad that you gentlemen have brought it up and I have had the chance given me of giving my views upon it. I have as I say published them here.

Now, gentlemen, there is another subject I would like to make a few remarks upon, the Prince Edward Island proposal. Three summers ago I visited it, professionally and I saw in that island a splendid opportunity to make an object lesson for Canada. I wrote a letter explaining my views and it was published in the *Island Farmer* and it subsequently led to the passage of that act by which cattle are not allowed to be taken on the island unless they have a chart showing that they have been tested within a recent date and found clear of tuberculosis. The penalties are

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\$200 for any attempt to do this, and the animals are slaughtered. The act is an excellent one. I went further than that. I had statistics furnished me by reliable parties on the island and found that it would only cost \$25,000 to buy and destroy at once all the diseased animals on that island. Now, gentlemen, while I am an advocate of Bangs system, I think it is a pity for such a paltry sum as \$25,000 that we should delay such a desirable object longer. If we extirpate tuberculosis from the island, and have the door closed so that it can never be brought into it again, and remove all source for the spread of the disease, what is going to happen? In addition to the money derived from having the best breed of cattle, the land will be doubled, probably, in value immediately, you will produce cattle there which are guaranteed free from disease, and you will command the market of the world.

*By Mr. Featherston:*

Q. Have they that breed of cattle there now?

A. No; they will have to import them, that is why I don't see that Bang's system is good for the Island.

*By Mr. Cargill:*

Q. How long since tuberculosis was discovered to be a disease in cattle?

A. In the world generally.

Q. Yes.

A. Oh! from time immemorial.

Q. Then, supposing you do land cattle in Prince Edward Island, perfectly free from disease, with a guarantee, can you say that it would not originate there, as it did when it first sprung into existence?

A. You require the seed to produce the plant, and unless you produce tubercular bacilli you can no more produce tuberculosis than you can produce oats without seeds.

*By Mr. Cochrane:*

Q. Where will you get the cattle?

A. Oh, there are plenty of healthy herds.

Q. But I understand you, professor, to say you do not consider a certificate given by a professor in Great Britain as proof positive.

A. That is quite right, but if we keep the animal three months in our quarantine then we can test them and rely upon it, after three months.

*By Mr. Sproule*

Q. Can you not make another breeding place on Manitoulin Island as well?

A. This will be an object lesson which will be of very great value to the country if it is carried out.

*By Mr. Cochrane:*

Q. Is it your opinion that there will never be a case of tuberculosis developed naturally in an animal in that island?

A. No; it will not develop in the animal, unless it is exposed to contagion; it may be from a consumptive person; but even supposing that an occasional animal would be diseased from contagion with a human being it will be a very simple matter to stamp it out when people understand it.

*By Mr. Roddick:*

Q. How long would it take to exterminate tuberculosis in the island if your suggestion is followed?

A. Probably a couple of years.



*By Mr. Featherston :*

Q. It is an excellent place for breeding cattle. The climate is something like England, but it has complete isolation and it is convenient to the ocean.

*By Mr. Rutherford :*

Q. We might compromise matters by having Mr. Edwards come down and buy these cattle where diseased cattle now exist.

*By Mr. Edwards :*

Q. Are there any conditions in Canada so near the conditions in Great Britain as the conditions in Prince Edward Island?

A. No.

Q. Is there any place so well situated as Great Britain for a breeding country in the world?

#### THE CONGRESS OF VETERINARIANS AT BADEN-BADEN.

Dr. McEACHRAN,— Gentlemen, if you will just bear with me for one moment there is another subject which will answer some questions put by Dr. Rutherford. In August last I attended a meeting of the congress at Baden-Baden at which some 600 or 800. veterinarians were present, having been sent there representing the different governments of the world, the whole world nearly being represented, so that it was a very high class meeting I assure you; and the conclusions which were come to by this Congress, are I think worth reading to you. I will merely read you the conclusions as to the prevention of tuberculosis among domestic animals:

"(1.) Prevention of tuberculosis in cattle is urgently needed.

"(2) The extinction of bovine tuberculosis on the part of the owners, (voluntary extinction) is practicable and should be universally aimed at. It demands the slaughter of dangerous tuberculous beasts as soon as possible, as well as careful protection of calves and the healthy animals from infection.

"The voluntary extinction of bovine tuberculosis should be encouraged by the State through the dissemination of correct views respecting the character of tuberculosis respecting the modes of infection, and the importance of tuberculin inoculation and be supported by State grants.

"The best means hitherto known for the prevention of tuberculosis among domestic animals is tuberculine."

There you see is a very strong endorsement of tuberculin.

"Tuberculine should only be supplied under State control, in any case it should be given to veterinary surgeons alone."

That I fully endorse; it should be dealt with just as poison is and given only to registered men.

*By Mr. Bell (Pictou) :*

Q. To experienced veterinarians?

A. Yes.

"(3) A state prevention of bovine tuberculosis is thoroughly to be recommended.

"If it is applied with a certain caution it can be carried out and will hinder the further increase of the disease and will gradually stop it.

"The prevention requires:—

"(a) The obligation of the veterinary surgeon to give the legal notice of every case of proved tuberculosis in the exercise of his practice.

"(b) The quickest possible slaughter of dangerously tuberculous animals (particularly those animals which are affected with mammite, tuberculosis of the matrix and of the intestines, as well as pulmonary tuberculosis) compensation being granted

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by the State, and the prohibition of the return of buttermilk from the co-operative dairies until it has been sterilized."

Now, gentlemen, there is the whole thing in a nutshell, and if you will take these suggestions and study them you will find they have been endorsed by most of these scientific gentlemen present at the congress.

*By Mr. McNeil:*

Q. Am I correct in supposing that you say the report which you read from the newspaper and which has been very largely circulated throughout Canada, to the effect that human beings are not likely to be affected by tuberculosis from cattle is quite misleading.

Mr. RODDICK.—It is quite misleading. The result of the experiment was quite the opposite.

The CHAIRMAN.—That is the reason it was read, because it has spread all over the province of Ontario and for that reason I asked these gentlemen to come here and give their experience.

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Having examined the preceding transcript of evidence of the 20th June, on Tuberculosis, I find my own statements therein, correct.

DUNCAN McEACHRAN, *F.R.C. V.S.*

*Chief Veterinary Inspector, for the Dominion of Canada.*





## PRODUCTION OF BEET ROOT SUGAR.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, March 15, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr McMillan, Chairman, presiding.

The CHAIRMAN.—We have with us to-day a couple of gentlemen who wish to speak on the subject of the Beet Sugar industry. Mr. Jenkinson, of Queensland, who is going away this forenoon, would like to say a few words to you regarding their experience in that colony.

### EXPERIENCE IN QUEENSLAND AND VICTORIA.

Mr. CHARLES M. JENKINSON, M. P., of Gympie, Queensland, Australia, then made the following statement:—

Mr. CHAIRMAN AND GENTLEMEN.—It was only when walking up to this committee room this morning that the idea was suggested that I might say a few words to you on this subject. I may say that in Queensland in regard to the sugar industry we rely particularly on the cultivation of cane sugar. We have tried, not to any large extent, the manufacture from the beet, but it has been an utter failure with us. Whether that has been due to climatic conditions or the labour market I am sure I cannot say. In the other colonies, New South Wales and Victoria, it has also been tried. There the climate is more likely to agree with yours than ours in Queensland which is a sub-tropical country; and even in Victoria where they were largely subsidized by the government it has been an utter failure and the Prime Minister of Victoria, Sir George Turner, at the end of last year had to announce that no further bounty would be given to the Maffra Sugar Company—that is the name of the best company, a large company—that no further subsidy could be given, and it was finally announced to the shareholders that the factory would have to be closed. It was not a success; it only managed to exist through the subsidies granted by the government. The farmers did not take the thing up in the proper spirit, as the promoters say, they should have. They laid the blame on the farmers, but the farmers again say that owing to climatic conditions they were not able to extract the quantity of sugar from the beet that the promoters led them to believe. That is our experience with the beet. Of course I take it you have to gain your experience and pay for it like us. I have no doubt you will find among your parliamentary papers of the Queensland government, much about this matter and the row created in the Victorian parliament; it was that which led to the downfall of the Turner government some time ago and the entry of the McLean government at the present time. The people were satisfied that this spoon feeding would not continue any longer and hence—

*By Mr. Rogers:*

Q. Were they paid by percentage?

A. I think by percentage, Mr. Rogers. I might be able to give some information if the gentlemen would ask me questions. It is hard to deal with an extended subject like this in a few minutes, and I find more information is elicited by asking questions. If any questions are asked I will be happy to answer them.

*By Mr. Cochrane :*

Q. What bounty did the government pay; how was it paid?

A. I am afraid I cannot tell you that; we are so far from Victoria that I could not tell you exactly. It varied, and it was larger when the industry started than it was in the last year.

*By Mr. Cargill :*

Q. What number of tons to the acre was an average crops?

A. I am afraid I could not tell you that, because it varied so much. In the colder climate—in one part of Victoria, right on the boundary—they had a larger crop than further over. I don't know what was the average crop. I have the information in a book at my hotel but I did not anticipate being here or I might have brought it.

*By Mr. Sproule :*

Q. Was any comparison made between the cost of beet sugar and cane sugar?

A. Yes, it was infinitely more expensive.

Q. Beet sugar?

A. Yes, but perhaps it would be right to explain this to you that with the cane sugar manufactured in Queensland—I may say we supply nearly the whole of Australia with sugar—we rely to a large extent on black labour to produce it, which is of course infinitely cheaper than anything that can be done by white labour.

Q. Have you any remembrance of the cost per ton for producing the two?

A. I could not give you the tonnage of cane. I know we produce up to 100 tons per acre of cane.

Q. But I mean the cost per ton of production?

A. No, I could not give you that.

Q. I understand that it cost from £8 to £12 some shillings per ton for producing cane, and it was in every instance save one that the cost of production of beet in Germany was less than cane?

A. But they have a bounty there.

Q. No, the actual cost.

A. We sell our sugar less than that in Queensland. We paid less than one million. It would cost about 10 shillings per ton and as it takes 10 tons of cane to make one ton of sugar that would be £5. Then there is the cost of carriage, which runs from about 9d. to 18d. per ton.

Q. I suppose you have no idea as to the percentage of sugar in the beet in your country?

A. No, I could not give you that. In Queensland?

Q. Yes.

A. But it has been tried to such a small extent that the figures are not reliable. Victoria has gone in for it extensively and lost.

*By Mr. McGregor :*

Q. How is sugar sold there by the ton.

A. You mean retail?

Q. Yes.

A. We retail over the counter—

Q. But by the barrel?

A. We make it up in bags of 70 pounds and it comes to, roughly, a retail price of from two or three cents a pound. That is refined.

Q. Granulated sugar?

A. Yes.

Q. How much is that?

A. From two or three cents a pound.

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*By the Chairman :*

Q. That is cane sugar ?

A. That is for cane, yes.

Q. Then there is really no beet root sugar made?

A. No, it may be said roughly that is so.

*By Mr. Henderson :*

Q. What was the object of growing beet ?

A. That Victoria might grow her own sugar instead of importing it from Queensland.

Q. They have a duty on sugar ?

A. Yes.

Q. You do not grow beet in Queensland ?

A. No, because we can grow cane so readily. But Victoria hoped to supply her own people from beet sugar and tried it and failed.

Q. Have you a duty on sugar coming into Queensland ?

A. Yes, there is an excise duty and we believe that under the commonwealth, when the Federal Parliament is established, there will also be an excise duty, which is forecast at £5 a ton.

*By Mr. Sproule :*

Q. But there is no custom duty ?

A. No.

MR. G. C. McMULLEN, CALLED.

The CHAIRMAN—I will now call upon Mr. G. C. McMullen to address the Committee on the Beet Sugar Industry.

Mr. G. C. McMULLEN, Watertown, N.Y., proceeded as follows:—

MR. CHAIRMAN and GENTLEMEN,—The rapid growth of the sugar beet industry in the United States, particularly in the last three years, has attracted the attention of sugar growers all over the world. Since 1890 they have increased about twenty-three factories, and there are now thirty factories in operation, eight of which have been completed in Michigan in the last year. I have been interested and am interested in this business in New York State and have given the subject a good deal of attention both in the fields and manufacture for the last three years. My attention was attracted a year ago by the quality of beets grown in Canada and their sugar qualities, and a careful investigation led me to believe that a factory or two, or possibly several, could be established here, at a profit to the farmer and eventually to the factory. I do not know of any industry that promises so much. Of course there are a great many gallery plays in this business as in many others, but I am here to give you the exact information, founded on the actual results both to the farmer, and so far as is possible, to the factory.

*By Mr. LaRivière :*

Q. Have you made a study of the past experience which we had in this Dominion with beet sugar ?

A. Yes, I have.

Q. Because the same promises were made to us, then, and the results did not bear them out ?



A. I will touch on that, if you like I will take this up right now. The early experience in Canada I have looked into, and I found this, it has been found by experience, that in no land has any factory with a capacity of less than 500 tons of beets to it, been productive of satisfactory results. The fixed charges are so high that the factory with the smaller capacity than that named has not been operated satisfactorily. Your seasons here would not extend to or exceed 125 days. You want to disabuse your mind of the fact that you can't work beets in this climate because of the frost, beets will freeze I know but that does not make a particle of difference under the system of wintering of the sugar beets which would have to be gone into here as in Michigan. What we want to get at is the quality. Quantities of beets were raised here at the time you speak of, but not in sufficient quantities to enable the factory to run their business successfully. I know nothing to the contrary but that the farmers were satisfied and they only went into it in a crude sort of way, but since then there has been a system introduced of instructing the farmers by the factories in the proper method of growing the beet. If you give the farmer enough seed for three acres of beets and tell him to raise the largest tonnage possible and give him no assistance, the chances are you will get a small tonnage and a poor quality of crop. Competent men are employed in my State as inspectors or instructors to the farmers. I have in my mind one man who has charge of one hundred plots aggregating 1,100 acres, who instructs the farmers and inspects the crop and he reports to the State each week as to the progress of each farmer's growing crop. Under the contract which is made with each farmer we reserve the right to go into his field and assist him. We know that he cannot grow the maximum amount of sugar beet without assistance, and that is what our State has appropriated for, to give him that assistance and instruction. For example in the State of Michigan which has now nine factories, and I will give you the results of the number of tons of beets which have been worked.

*By Mr. Sproule :*

Q. That is for this year?

A. For last year.

Q. I never saw anything for last year?

A. I think you have the results there of Michigan, from Mr. Fowler. In this comparison remember three years ago, there was not a beet sugar factory in Michigan, no beets were raised, no sugar made. Here is the report of the State Land Commissioner, French, of the Beet Sugar Production in Michigan during the season just closed, which is as follows: I will give you the aggregate tonnage.—210,971 tons, beets, and 30 millions of sugar were manufactured.

*By Mr. Sproule :*

Q. Thirty million pounds?

A. Yes, 30 million pounds. That means that nearly a million dollars is paid to the farmers for beets. They had a difficulty in the first season as they usually have in starting. It was a new crop, it is a new crop here and no doubt many gentlemen are prejudiced that know nothing about it, that the farmers cannot raise this crop but certainly they can, at a profit of \$4 per ton. You will find in this locality as in all others, that there are farmers, and there are farmers, and the beet crop will pay them if they cultivate it properly; but you cannot grow beets unless the seed is sown at the proper time and the crop is properly cultivated, and we do not want any farmer to grow beets for us unless he is prepared to follow our instructions.

#### YIELD OF BEETS PER ACRE.

*By Mr. Cochrane :*

Q. What is the tonnage per acre?

A. The average tonnage per acre in New York State from all the factories in operation there,—at the Rome factory 15 tons per acre, and at the Binghamton

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factory 17 tons per acre. The results in Michigan I have not got complete as to the tonnage. The experiments in Ontario as far as I have seen them, but I would not make that a point for you to rely upon, because the tonnage is exceedingly large, and I do not believe it can be kept up, when you talk about 22 to 24 tons to the acre, I think it is excessive and all our estimates are made upon the very much lower average crop which I will place at 14 tons per acre. Of course the agriculturist knows when he begins to grow the proper beets, that a large percentage of the cost of that is for labour.

*By Mr. Sproule :*

Q. The yield per acre in Michigan was 15 tons I see?

A. That is the average.

Q. Is it a very loamy soil?

A. It is a sandy soil there. Now in the establishment which we propose planting here, we propose to pay four dollars per ton for beets.

Q. Is that at the factory?

A. There is no transportation for the farmer, a man thirty miles from the factory gets the same price as the man who is three miles away; we propose to give them their seed free the first year, we propose that our own experts who will be paid by the factory, which in a 500 ton plant would require not less than eight, to give the farmers all the instruction that is necessary in order to get a perfect crop. I have no doubt from the experiments that have been made and the tests that have been made, that the tonnage in Ontario will exceed that of Michigan or New York State; I am taking your statistics as my guide. They are very large and if the record is maintained, the farmer will make a large sum per acre. But every man may not grow the quality of beets we desire. Therefore we not only help him to increase the tonnage but we ask him to grow the quality of beets we want, and it is for his interest to do so, for although on the start we expect to pay a fair price of \$4 per ton for beets if they are 10 per cent, we are the loser, while if they are 16 per cent we are the gainer. We would prefer to buy beets upon their sugar qualities, but in the opening of an industry such as this, it is almost impossible to do business upon this basis, but we hope it will involve into that eventually and it will be better for both parties. I must not omit to state that we also intend to give to the farmer the pulp which constitutes from 40 to 50 per cent of the main product, and which is the principal and I may say the only by-product of any value.

*By Mr. Sproule :*

Q. Give them free?

A. Yes, free.

*By Mr. Hurley :*

Q. Delivered back to the farmer?

A. Well, he draws in a load of beets and we will give him a load of pulp back. Is that the correct answer?

Q. I understand you to say that that was at the farmer's residence, that he got the price of four dollars a ton?

A. The farmer gets four dollars a ton at the nearest railway station or hauled to the factory. We stand the freight. He is entitled to the same amount of pulp that his beets produce. It varies from forty to fifty per cent. That pulp is f.o.b. at the factory. The same arrangement can be made in transporting pulp in car-loads that we have in the case of the beet.

*By Mr. Sproule :*

Q. Do you pay for the transportation of the beet?

A. We do.

*By Mr. Hurley :*

Q. That is what I understand ?

A. Yes, we do. ~~39.170~~ ~~on~~ ~~the~~ ~~beets~~

*By Mr. Ratz :*

Q. May I ask you in what mode you improve the quality of the beets? I understood you to say that improving the quality is increasing the sugar percentage?

A. Yes, that is done by intense cultivation. It depends on the mode of farming, deep ploughing and careful attention to the crop. We require close attention to the thinning. When the time comes the beets must be thinned out. The thinning must not be put off as a farmer is apt to do if he is busy. We insist on that being attended to. We know that he will see the good results after the first year. We have not very much to do the third year; the first and second year is when we have to insist on the work. The chairman asked me as to the delivery of the beets. We write contracts wherever the factory is located within an area of three and a half miles, not to exceed four miles, for hauling beets, and as many farmers in that vicinity as can grow beets and have the soil have to haul the beets in and they haul their pulp back. The man who lives 25 miles away gets the same price for his beets as the man within the three and a half miles. We stand the transportation on the beets, and after he has tried it free one year he is very glad to get it.

#### COST OF PRODUCING THE BEET.

*By an hon. member :*

Q. What is the cost to the farmer, of producing those beets, who hauls them say four miles to the factory to deliver them. What does it cost him to grow them and deliver them this four miles?

A. He will include that haulage because the four miles haul to the station fifty miles away from the factory, amounts to the same thing. We pay the transportation on the beets. The cost of cultivation complete has been given by a good many experimental stations and farmers. I know of no way to get at it but the practical way of getting a series of farmers to give their experience. We have several hundreds on them on file. The cost ranges from \$22 to \$35 which includes topping and hauling. These, gentlemen, are from actual results, hundreds of them.

Now we will take the maximum cost of production, and understand in this cost every item the labour of the farmer's man, of the farmer himself, his horses and his children are allowed a certain price per day. If you want to get the exact cost of production and the profit I do not know any other way to do it. We will take the maximum cost of \$35.

*By Mr. Clancy :*

Q. That includes delivery?

A. That is 50 cents for delivery.

*By Mr. Wilson :*

Q. What is the total cost?

A. \$25 and \$35. I will take the minimum crop of beets which is 14 tons. 14 multiplied by \$4 gives \$56, which at a maximum cost of \$35 leaves a profit of \$21.

*By Mr. Sproule :*

Q. Net profit.

A. Net profit. I assure you gentlemen that this is very conservative statement. I have made that statement in the presence of farmers who were beet



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growers, practical beet growers of experience, and I have been called down both for the cost of the production and the tonnage, but I am not here to give you the rosy side of it. I want you to figure with that as a minimum.

*By Mr. Meigs:*

Q. Where do these men live?

A. In Michigan, Nebraska and Oregon and other States. I would give you the addresses of fifty or a hundred farmers to whom you might write if you choose, and obtain information.

*By Mr. McGregor:*

Q. American or Canadian?

A. American. The Canadians have raised none that I know of except in Quebec.

*By Mr. Meigs:*

Q. They have in our town.

*By Mr. Wilson:*

Q. Anyone who wants to know the addresses can get them privately?

A. Certainly.

BEET RAISING *versus* OTHER CROPS.

Taking the maximum result perhaps you would like to compare it with the cost of other crops.

*By Mr. Cochrane:*

Q. Do you take into consideration the rent of the land?

A. In the cost?

Q. Yes?

A. At \$30, I certainly did, at \$6 an acre. It would be interesting perhaps to compare this with the cost of other crops.

*By Mr. Clancy:*

Q. That is a very important statement. Does the gentleman make the statement, that in calculating the cost he has at the outset allowed for the land?

A. Yes, in the \$35. There is no other way to get the cost except in that way. Here is a report for comparison. It was handed to me and is the result of the experience of 197 farmers in Ontario who were asked to give the cost of certain crops. The cost of growing certain crops and perhaps for comparison it would be interesting and to the point. The first crop is fall wheat. These are your own report gentlemen just as carefully gotten up, I have no doubt, as ours are and as intelligently.

Fall wheat cost per acre \$19.43.

Q. Averaging how many bushels?

A. I will give you that next.

The average yield was 17.8 bushels. The total value of grain at 80 cents, is that a correct value?

*By Mr. Broder :*

Q. Yes, that is a correct price, a fair price.

A. Well at that rate, the total value of grain is \$14.24.

The value of straw was \$2.95.

The total value of the product \$17.19. You can put the rent in if you like.

You get receipts of \$17.19 for what costs \$19.43, a net loss of \$2.24.

That statement I believe is the experience of about 200 farmers and I will tell you, on that point that, not one farmer in a hundred—I am not talking of here in Canada, for you have more intelligent farmers—can tell you at the end of the season whether he has made a profit on hay or butter or cheese or oats. He knows that perhaps at the end of it, his mortgage is a little bit smaller or that he has nothing to reduce it. Now in the beet crop we average in the same way.

*By M. Clancy :*

Q. What about oats?

A. The total cost per acre for oats is \$14.78.

Q. Does that include marketing as part of the cost?

A. That is the report of the Ontario Bureau of Industries for 1887.

Mr. CLANCY.—I have no hesitation in saying it is out of all reason and is bad sense to put the cost of oats at \$14.78 per acre.

Hon Mr. PERLEY.—I can raise it for half that.

Mr. G. C. McMULLEN.—I have not given you the figures for oats yet. The total cost per acre of production is \$14.78, the average yield  $31\frac{7}{10}$  bushels; total value of grain at 30 cents per bushel, \$13.11; straw \$3.60.

*By Mr Macdonald (Huron) :*

Q. Let us understand on what basis you make that. Does it include so much for rent of farm, his own labour and his family's?

A. The figures given me are the official ones made up by the Ontario Bureau of Industries.

Mr. CALVERT.—I may say I compiled the statement from the report of the Ontario Bureau of Industries for 1887, to which Mr. McMullen referred me, and I found they made those statements.

Mr. BRODER.—That is the report for 1887?

Mr. CALVERT.—The only one I believe published.

Mr. BRODER.—Oats have fallen greatly in price.

Mr. CALVERT.—In that compilation of cost was included \$3 for the rent of land, the cost of growing, of horse hire, of labour, seeds, and everything included just as Mr. McMullen has given the cost of growing beet. He has included everything in the cost of beets at \$35 in the same way that it is included in the cost of oats at \$14.78.

Mr. WILSON.—What wages were allowed?

Mr. CALVERT.—\$1.50 per day for a man with a single horse and \$2.25 for a man with a team at that time, but Mr. McMillan explained to me at the time that the cost of labour and growing would be about the same now as then.

Q. The reason I asked was—I think the calculation is right but I wanted to know the items. You see the farmer here receives so much for rent, wages of himself and children, and marketing, and then he receives pay for his manure, and I think myself the cultivation and labour will probably cost \$14.78; so it is well for the committee to know what the cost includes?

A. Well, I understand as these statistics came to me that they corresponded with what I showed in the matter of beets.

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*By Mr. Broder :*

Q. It is not so much the price given to farmers as the question answered by feeding grain to cattle and not selling it, and so making more, and that is the question which comes up in your business.

A. I will answer that question, you refer now to the feeding of grain to your cattle—

Q. I would say, that the principle of selling grain is not done in this country now. The best farmers do not cart their grain to market, they grind it and feed it to milch cows, and so get more for it in that way.

USE OF BEET PULP IN FEEDING.

A. Now as I understand the situation here, it is a dairying and cattle raising section. I do not believe Dr. Wylie is more emphatic than your own very able man here, Prof. Robertson, who is very emphatic on placing a higher value on this pulp. I take the position that the way to find the value of the pulp is to give it to your patrons and let them find it out. This is a dairying country and every man is of opinion that if you consult your best interests you will raise beets also; the industries go hand in hand. I will read you a little thing on that point of beet pulp from Prof. Henry's book, 'Feeds and Feeding.' This is what he has to say on this subject:

'Beet pulp makes a very fair quality of silage, and because of the large quantity turned out by the factory in a comparatively short time much of the pulp should be preserved in the silo in order that the period of its usefulness may be materially extended. The simplest form of preservation is effected by excavating trenches three or four feet in depth and wide enough to drive a team and wagon through. Loads of beet pulp are deposited in this and when the mass is several feet above the surface of the ground it is arranged with sloping sides which are covered with straw, and on this, earth is placed to keep out air and frost. For storing pulp the silo, constructed in the same manner as for the preservation of green corn, will in the end be found more economical. Beet silage is relished by cattle, and serves well for feeding them, both for flesh and milk. It has about half the value of corn silage.

On that particular point of the commercial value, Prof. Robertson puts pressed beet pulp higher than beets themselves. I suppose that a man who gets \$50 or \$60 for his beets and gets the pulp returned has made \$50 or \$60 if he has the cattle to feed this pulp to. Prof. Henry continues:

'Farmers growing beets for the sugar factory should not be content with this operation, but should add to their system that of feeding a large amount of pulp—at least as much as results from the beets grown by them. By feeding stock with beet pulp and the other waste of the crop, large quantities of manure will be made which will assist in keeping the farm in high fertility, assuring large crops from the beet fields and ample forage from other lands, used in rotation, for the maintenance of live stock. A farming community which will intelligently grow beets and utilize the pulp resulting from them in the feeding of cattle will be able to grow as large crops, in addition to the beets, as were produced before adding that industry, and to maintain many more cattle than was possible before beet farming was inaugurated. This statement is warranted by the conditions prevailing in the beet districts of Europe. Beet culture means more cattle and larger crops generally, rather than less, provided always that the pulp from the beets is properly utilized.'

*By Mr. Cochrane :*

Q. Where does Prof. Robertson make that statement ?

A. That is not Prof. Robertson, it is Prof. Henry.

*By the Chairman :*

Q. Have you had the pulp analyzed by reliable chemists ?

A. Yes.



*By Mr. Cochrane :*

Q. I understand you to say that Prof. Robertson says that the pulp is worth more than the beets ?

A. Prof. Robertson made that statement to me.

Q. I should want some one to prove it ?

A. What was the question ?

Q. If Prof. Robertsen said that I should want some one to prove it ?

A. I think if you go to Prof. Robertson he will repeat the statement to you that he made to me.

*By Mr. McMillan :*

Q. What is in this pulp ?

A. I cannot go into that fully, as I have not the documents with me now.

Q. I should think that is the true test of its value ?

A. Certainly.

#### STATE BOUNTIES.

Now, gentlemen, we will get down to the meat of this thing, and that is on the question of bounty. In every State in the country where this industry has been established successfully, it has been necessary for State aid or government aid at least until it has passed what is called the experimental stage. In California, which is the pioneer, it is now working without a bounty. During the infancy of the industry there, they had a Federal bounty of two cents per pound. It was started in Utah with a bounty of one cent, and it was necessary to have a bounty in order to make it successful, but now this bounty has been withdrawn. In New York a bounty is given of one cent per pound, and in Michigan of one cent per pound.

*By Mr. McNeill :*

Q. How long have these been in existence ?

A. In New York this is its third year. In Michigan it is the third year. In New York no time is specified for the operation of the bounty, but it is understood that five years should be the maximum.

Q. You mentioned a State, a moment ago, that granted a bounty and then withdrew it. How long was it in operation ?

A. That is the State of California. That was not a State bounty, it was a Federal bounty of two cents, it was in operation two or three years, and the industry is now at its height. The new factories that have started, since the bounty has been withdrawn, have no difficulty in competing with the old factories, because the farmers have been educated and are producing a high quality of beet.

Q. They manufacture cane sugar there I believe ?

A. The cane comes in from the Sandwich Islands, but the beet root sugar has been established in California upwards of thirty years. But never had a boom until recently. Your neighbours in Michigan have a bounty also.

Q. Is it true that the bounty has been withdrawn in that State altogether ?

A. No, I do not think so. It has not been withdrawn but they have had some difficulty in getting it paid, there, it was a very phenomenal growth and it has proved disastrous to some of the factories simply on account of going into it in an indiscriminate way.

Q. You are not prepared to say whether it has been withdrawn in Michigan or not ?

A. No, it has not been withdrawn.

Q. The reason I asked the question is that a gentleman up in my part of the country, who proposes to assist in establishing the new industry there made the statement the other day definitely that it had been withdrawn.

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A. No, it was established for a period of seven years.

*By Mr. Macdonald (Huron):*

Q. Why is it necessary to make such an extraordinary price?

A. A great many people think it is not necessary. In Oregon instead of doing what we propose to do here, they buy the land, colonize it and raise their beets. There is no difficulty in raising beets at a maximum cost of \$2.10 per ton.

Q. Why does the factory pay the farmer such an extraordinary price when they can get their raw material at any such price.

A. They do not.

Q. Did you not say that \$14.00 per ton was paid?

A. Four dollars per ton, 14 tons to the acre.

Q. If four dollars per ton will give on an average crop a profit of \$21.00 per acre cannot the farmer be induced to go into the growing of beets without a bounty and then the farmer would get, say ten dollars profit per acre, and therefore the \$2.00 saved by the manufacturer would be a bonus to him instead of your asking for a bounty?

A. I do not know but what you are right, but I anticipate they might go to a farmer and ask him to raise a new crop, and they would buy it at any less than four dollars per ton he would turn you down. However there is a point in what you have mentioned. There is more profit a good deal in raising beets than in the making of sugar from them, consequently Spreckles and others buy large tracts of land, colonize the territory and raise their own beets. Their maximum cost is two dollars per ton and the minimum cost \$1.85 per ton, for beets. Certainly if they raise beets at that price, it is fair to say that the beginner could raise them at a cost of \$2.50 per ton.

*By Mr. Rogers:*

Q. Has the nature of the soil an influence on the quality of the sugar beet?

A. We get better results a great deal from a loamy soil, sandy and gravelly loam. Hard, sticky and baking clay while it produces a fairly good quality of beet, perhaps a very good one, is of a character that discourages the farmer. In order to redeem that soil, one of the bye-products of the factory called lime cake is given the farmers, where they are near enough to haul it, and that acts as a fertilizer and mellows the soil, and we have refused in many cases to write contracts with farmers who have this kind of soil and want to grow beets on it. A farmer believing he is going to realize 25 tons to the acre, and make all this money, we want to disabuse his mind of the idea. We will not write a contract except he has the right soil, and we will not write an excessive contract, but we write what a man can evidently grow upon the soil that he has. We would rather have 2,000 farmers contracted with three acres each, than one thousand contracts with six acres each or 500 contracts with 12 acres each.

*By Mr. Beith:*

Q. What is the best quality of soil?

A. We get the best results from a sandy loam. That gives the better average. There is a very large difference in these soils, upon the point of productiveness.

In connection with this comes up an argument that has been used against the industry and that is the exhausting quality of the beet. It is said it exhausts the soil, beet paralysis and all that. As a matter of fact there is no root crop or any crop that exhausts the soil less than beets. Up to the first of September the nourishment for the beet, the sugar part, is taken from the soil, but after that date it is not. If it were not for your long cool September and October days you could not raise the quality of beets that you do, in Canada. Analysis shows that scarcely sixty per cent, not more than sixty per cent of the nourishment is taken from the soil, forty per cent is taken from the atmosphere chemically through the leaves. After this crop is grown and

properly topped, these tops are ordinarily left on the field and plowed in. In doing this you have restored all that is necessary. You do not need any other fertilization and next year that beet acreage will give you a larger crop of potatoes, which I believe are largely grown here, corn, or any other crop you have on that same soil. Why? Because the crop that is grown in the particular patch which requires perfect farming, deep plowing, and intense cultivation, will produce more than any other crop you have. Your succeeding crop will be better no matter what it may be.

I have forgotten just where I was, but I think it was on the question of the bounty.

Some honorable members.

That is right.

I was saying that these States had paid these bounties and it is necessary for instance at the beginning of a campaign, a man brings us in a hundred tons of beets we buy them without any regard to quality, relying on what the climatic conditions of the country are. If he could assure us that those beets would turn us out  $10\frac{1}{2}$  to 11 per cent of granulated sugar I would not be before you this morning, but the results show that they do not. In Michigan the results from several factories there indicate this and I think that their experience will perhaps do as well as anything that I can say.

#### YIELD OF SUGAR PER TON OF BEETS.

President Cranage of the Michigan Company has collected statistics as follows: This is the amount of sugar realized from each ton of beets then:

Michigan Sugar Company 182 pounds to the ton,  $9\frac{1}{2}$  per cent.

This was the Michigan Sugar Company's second year. The education of the farmer in the first year helped as you will see by the following results.

Peninsular Sugar Refining Company 158.9 pounds per ton, or 7.94 per cent.

Detroit Sugar Company 8.47 per cent, 169.4 lbs. per ton.

Alma Sugar Company, 8.3 per cent, 167 lbs. per ton.

Holland Sugar Company, 6.43 per cent, 128.6 lbs. per ton.

Wolverine Sugar Company, 7.99 per cent, 159.8 lbs. per ton.

Kalamazoo Sugar Company, 7.38 per cent, 147.7 lbs. per ton.

Bay City Sugar Company, 8.46 per cent, 169.2 lbs. per ton.

Now they say which proves the case.

'The Michigan Company leads all others. This may be accounted for to a certain extent by the fact that the great majority of its contractors had the experience of two years in growing a crop, consequently they were able to turn into the factory a superior quality of beets.'

Now having the soil we purpose if a cent a pound bounty is granted which in my opinion will be necessary to be done some time if you care to establish this industry here—and it need not be continuous. The bugaboo seems to be that if this thing is started it will bankrupt the Dominion. It did not bankrupt the United States or the State of New York. You will not find people plunging in here without experience and money; it takes half a million dollars to come in here and establish a plant. We would like to come in and rely on the good quality of the beets eventually to make something of it, but while we are experimenting the farmer makes his share just the same. He does not get as much the first year as the second, he will probably increase his tonnage and decrease the cost. We cannot tell each farmer how to raise this very year the best quality of beets, but they get the meat in the cocoanut very quick. One or two pioneer factories will stand the brunt of this matter and after we have demonstrated to our own and to the farmer's and to the Government's satisfaction, that our plant or plants can be run without assistance, we do not expect it to be continued. We come here honestly and tell you the exact situation. We do not make an exorbitant demand. In fact we make no demand. We suggest that this industry may be established in this way and I say confidently



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it cannot be established in any other way. You have the soil, you have the farmers who are willing. I think the sentiment is strong in the agricultural sections that the farmers are willing to raise this crop. Now if that is the case, I think government aid could be diverted in this direction in a moderate way. The farmer does not get the benefit of a great many acts of legislation in this country as in ours.

And if there is an honest chance if in your calculations you come to the belief that our statements are correct, and the evidence that you gather from other sources is of such a nature that it is wise to grant a bounty—not political, this is not a political measure, this is a measure that appeals to agriculture, the foundation of the prosperity of Canada as it is of the United States.

If that is the case I can hardly see what would be criminal or an injustice to at least give us encouragement to start one plant.

IMPORTS OF BEST SUGAR FROM GERMANY.

I want to show you something else. A man may make the statement "you will overdo this and you will take our revenue. Here are so many million dollars we receive from duties on sugar." We were doing the same thing in the United States. Here is what the cunning Dutch German farmer does. The imports from Germany to the United States in 1896 were \$16,000,000, in 1897 they were \$16,017,000, in 1898 they were \$9,600,000, a decrease of \$7,000,000. Why? Mr. Michigan gets into line, Mr. New York State gets into line. How have they got into line? They go before their legislatures and say "we want to start, are you willing to help us?" Every State has helped. I appeared before the Agriculture Committee of our State and asked for a larger appropriation. Mr. Flanders says "I am very glad to take this matter up for it shows progress. We have had two small factories. I believe in it, I will advocate it and try to get the appropriation." His idea was if it was a good thing for the agriculturist, it must be pushed, it must be encouraged, it must be enlarged.

That is so much for the United States; now we will take up Canada. Canada in 1891 received from the German farmer 14,200 tons of beet sugar. In 1895—I have not got the intervening years—Canada received 15,844 tons.

*By Mr. McGregor :*

Q. What is the value ?

A. I could not give you the value because I did not know the price here.

*By the Chairman :*

Q. That is the quantity of sugar ?

A. Imported from Germany into Canada. The first example was from Germany to the United States, showing a decrease of \$7,000,000, which sugar we manufactured from beets in the United States, and the money was paid to the American farmers instead of to the Germans. In 1897 the Canadians imported 21,896 tons; in 1898, 45,821 tons; for 1899 I have not any statement. We show a decrease from 1897 to 1898 of something like \$7,000,000 of sugar bought from the German farmer. You show an increase of sugar imported from Germany from 1897 to 1898 of over 100 per cent.

Now for the English market. England is the largest consumer of sugar in the world per capita and the United States comes next. England received from Germany in 1894 509,000 tons of sugar of the value of \$31,600,000. In 1895 she received 638,997 tons of a value of \$33,100,000. In 1896 she received 517,463 tons of a value of \$30,800,000. In 1897 she received 571,576 tons of a value of \$28,900,000. In 1898, and last, she received 639,525 tons of a value of \$32,200,000. Now, gentlemen, I want to ask you a plain question. The result of that you will see—if this is a success in Canada—would mean that factories enough would be

provided to manufacture what we want for local consumption. That would take about 35 factories of the capacity we expect to establish; of which we would establish one. Now cannot Canada produce sugar as cheaply as Germany? What is the reason? Give me one?

COMPARATIVE COST OF LABOUR AS AFFECTING COST OF PRODUCTION.

*By several Hon. members :*

Q. Labour.

A. That is the point I wanted to make. You cannot hire labour here for 30 cents a day, but with improved machinery for making sugar from beets such as we have in this country you can compete with Germany and low labour? In fact with the Philippines annexed and labour at \$8 a year, we believe in the United States that we can compete not only with Germany but with the Philippines. Now with England the largest consumer in the world, you are in shape to supply the mother country when you get through here. We will hear claims that we can make and export against Coolie labour in the West Indies, but it is a long time before that can take place, but you have always got the local market that it would take 35 factories to supply.

*By Mr. Tucker :*

Q. There is a question I would like to ask with regard to this matter. You have stated clearly one view. I should like to hear—I am not a farmer—your views as to the return the land occupied by these beets would make to the country. What would it bring an acre to the farmer?

A. To get at that I took what would be the maximum cost of production, and what we would call a minimum yield of 14 tons, and it would leave a profit to the farmer after paying for the labour of himself and family, hire of horses, &c., of \$21 per acre. That is the minimum profit we would allow. I could read you pages of letters from farmers who are making profits of \$50, \$70, \$80 and \$90 an acre, but I give you the maximum cost of production and the minimum tonnage of crop, and even then it is good enough.

*By the Chairman :*

Q. Could you give us the cost per pound of producing beet root sugar?

A. I will give it to you in tons. That is a matter I could not give in detail, because I am not familiar with the cost of lime and coal, but approximately you would pay \$2.60 to \$3 per ton of beets.

Q. But what would be the cost of granulated sugar?

A. That depends.

Q. But the average, you have a certain average cost of production per ton or per pound?

A. At 8 per cent I will give you that. It will be 4.11 cents.

Q. Per pound?

A. 4.11 cents per pound.

*By Mr. Sproule :*

Q. That is with what percentage of sugar?

A. Eight per cent. We cannot do better; we would run  $7\frac{1}{2}$  per cent. You see I read you the results of Michigan. Those in operation two years run 9 and a decimal.

*By Mr. Cargill :*

Q. What is included in the cost?

A. Every item of expense.

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Q. Interest on capital?

A. Yes.

Q. What is the sugar worth?

A. Granulated sugar was worth two weeks ago in Canada \$4.38; that fluctuates with the market.

*By Mr. Broder :*

Q. You cannot control that?

A. No.

*By Mr. Cargill :*

Q. Much depends on the quality of your land.

A. I presume the same conditions are in force here as with us.

*By Mr. Rogers.*

Q. Is it profitable to grow beets on the same land repeatedly year after year or must you change?

A. Rotation is better, but not necessary, although nearly every agriculturist of any experience says he can get better results from rotation, we believe that the rotation should be for three years, corn, beets and potatoes.

Q. I understand you to say that you can compete with Germany, by using improved machinery? What is to prevent Germany also, from getting this improved machinery?

A. Nothing, except that they have so much cheap labour there which they have to employ.

Q. Well, if they have cheap labour, and get the machinery through, why can't they manufacture as cheaply as you can?

A. They do not want to get improved machinery, they have to keep their cheap labour employed.

Q. If they find that they are losing their market they will soon get down to using improved machinery?

A. They have not yet while they are losing their market. We are competing with Germany to-day, there is not a pound of German, bounty fed refined sugar coming into the United States to-day. There are nearly 500 refineries in Germany. In Germany by the system in vogue there, as one of these gentlemen has mentioned, the German manufacturers themselves are large beet growers.

*By the Chairman :*

Q. For what reason?

A. For the money that there is in it.

Q. Because they cannot get the farmers to produce the beets at the price they pay, is that the statement?

A. I beg pardon—you will find if the farmers do not produce beets, and if a factory is established, that same factory is a pretty poor investment. If we locate a plant here worth a half a million dollars, and if we don't get the beets to feed it, if we have misrepresented these things, Mr. Farmer lays down, and does not raise beets, and if he doesn't we can't make sugar, and if we can't make sugar, you don't have to pay the bounty, and our factory is sold by the sheriff. I can see no difficulty or no reason why farmers should not raise two or three acres of beets if we locate our plant here. It is a partnership affair, if the farmer does not believe in it and has scruples about going into it, and does not believe that it is profitable we have not a minute's time to spare. But the statement we have given him is correct. If we are willing to risk \$500,000 in putting up our factory and plant, certainly the farmers should be willing to raise two, three or five acres of beets when we give him the



seed, for one year. He doesn't lose anything. Is there any risk proposed to any man, agriculturist or other, when we say we will buy all the beets you will raise at four dollars per ton for three years. You put in ten acres of beets to-day, and they are sold at a profit I have mentioned, and what are you going to get from your hay, butter, cheese and other produce. It depends upon the supply and the demand. When there is a big crop it is small prices, when there are high prices it is no crop. That is the history of agriculture, but you can't raise too many beets for a sugar factory. You raise the beets and we buy them from you and give you back your pulp so that you can still feed your cattle. I don't know any better proposition. All you have to do is to raise the largest tonnage possible at the smallest cost. You raise a certain amount of seed for feed, and some gentlemen take this position that I can raise these beets and feed them and make as much money by feeding them as I can by selling them to the factory. Now, how many of you raise yourselves, say three acres, to feed your stock, but can raise fifty acres for us, and we will buy them all from you, and give you back your pulp so that you can still feed your cattle. I don't know of any better proposition, by which you can dispose of your commodity which is sold for you every year, at a fair price.

*By Mr. Rogers :*

Q. What is the nature of the contract that you give to the farmer ?

A. It is very simple indeed. We give him the seed the first year, and the price per ton we pay him is stated in the contract.

*By Mr. Sproule :*

Q. Is that price per ton given exclusive of the quality of the beet ?

A. You can if you like specify a certain amount of sugar should be in the beet, but that is an unpopular method with the farmer.

*By Mr. Clancy :*

Q. Is there any classification of the beet according to the sugar in it, or do you give that prices for all the beets offered you ?

A. We take the beets as they come. We have got to depend on our agriculturist and upon the soil to give us the requirements. If we were to fix a maximum or a minimum we could afford to pay fifty cents a ton more for 16 per cent beet. But you will realize that for the first year or two we will not get that amount of sugar out of the beet, that we will at the end of four or five years when the farmers have more experience.

Q. Does the soil have an effect upon the percentage of sugar ?

A. Yes. The soil does and the cultivation also.

*By Mr. Sproule :*

Q. And the sunshine ?

A. Yes, the sunshine.

*By Mr. Cargill :*

Q. How much sugar will a factory produce in the year ?

A. Ten million pounds.

#### MACHINERY—BOUNTY ON EXPORT.

*By Mr. Sproule :*

Q. Don't you find that in Germany with the improvement of their machinery they are taking a much larger amount of sugar out of their beet ?

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A. Each year, yes. That is just the point that we are getting to. That is the basis of the bounty that you cannot get the amount of sugar with indiscriminate farming in a new industry that you can out of the beet after a few years experience. Germany has been at this for fifty years, and Napoleon started it 100 years ago. It has been a series of evolution there, but you must remember that their farms there are all small, and there they believe it is not necessary to rotate the crop.

*By Mr. Parmelee :*

Q. What is the percentage in Germany—what is the bounty in Germany?

A. The bounty is paid on the exports in Germany. It is rather difficult to get at the exact amount. For purposes of comparison it would not be a very bad idea to compare Canada with the other countries. In California the average—and this is about the same as the Canadian production—is 14·38 per cent with a purity of 83·70; in Michigan it is 12·04—that was in 1890, but it is over that now, it is over 14 now. Ontario's latest, that is up to 1897, is an average of 14·24 with a purity of 83.

*By Mr. Henderson :*

Q. I would like to ask Mr. McMullen. He says this industry started thirty years ago—now we would like to have an idea of the progress of the industry in these States. How many factories have they in California of such a character as you propose to establish here?

A. There are 8. The largest one in the world is the Spreckles—2,000 ton factory.

Now, gentlemen, there is an object lesson. There is the old king of sugar refineries that made his millions in cane sugar; he goes on the coast in California and buys an interest in a refinery there, a beet sugar refinery, runs it two or three years, and then buys several thousand acres of land, and two years ago he built the largest beet sugar refinery in the world.

Q. What is his name?

A. Claus Spreckles.

*By Mr. Clancy :*

Q. Would you give us the percentage of sugar to the ton of California beets, as compared with Canadian or Michigan beets?

A. Yes, I can give you the percentage in California beets. The percentage of sugar in the juice is 14·38; purity 83·70. In Ontario the sugar in the juice is 14·24, and the purity 83·06.

You must remember, gentlemen, that in locating here the conditions are very different from what they are in California. Here I believe we will get as high grade beets, and we have climatic conditions here which are very different. Here we have to take frozen beets, but in California if you leave a beet out a few days it goes off in quality. As a matter of fact south of the Mason and Dixon line you cannot produce beets under the best condition. The farther north you get while you keep away from the early frost line, the better the beets.

Q. What capacity would your plant be?

A. A capacity of 75,000 tons of beets. That would be 5,000 acres of fourteen tons. We commence receiving beets about October 1. We want them all housed by December 1, although here it will be optional with us. The near by farmer says: 'I cannot draw them in, I am busy.' We say: 'All right, throw some earth over them, and bring them in, in January,' for we would as leave have beets frozen as any other way. It is a point not to be forgotten, for it is important that if the farmer is busy in October we say: 'Here, all right. You deliver them in January.' Then in January he takes his covering off, loads his beets on a sleigh and draws them to the factory.

## EMPLOYMENT AND LENGTH OF SEASON.

*By Mr. Erb :*

Q. How many hands would you employ and for how long?

A. 120.

*By Mr. McNeil :*

Q. What did you say about the frozen beets.

A. The frozen beet can be used as well as any other. We have no difficulty in taking sugar from a frozen beet. But we must keep it frozen till we use it. I believe we can run a factory here longer than in any other part of the country. We would run about 140 days.

*By Mr. Pettet :*

Q. About how long would it likely be?

A. Not less than 110 days but our force of skilled labour we employ the entire year.

*By Mr. Wilson :*

Q. What proportion would be skilled labour?

A. About 12.

*By Mr. Rogers :*

Q. The others would be employed in the factory, when not employed on the farms.

A. Here is the way it is done in a great many sections. We will say some gentleman here does not want to grow beets. Then a fellow comes along who wants to raise beets, we rent, say ten acres from that farmer, then he cultivates his beets, and brings us the product. We take out the rent from the amount and give him a cheque for his beets. Now he has derived the benefit of the labour of himself and if he has a wife and four or five children of their labour, and he has four or five hundred dollars, in his vest pocket more than he ever had before, the man says 'I am through with beets.' We say 'all right, go into the factory.' He works for the season in the factory and next year he takes twenty acres.

*By. Hon. Senator Perley :*

Q. How do you manure it?

A. In various ways. Common manure, liquid manure, fertilizer, etc.

*By Mr. Cargill :*

Q. Those factories, that have been running successfully in Michigan for some years, can you give an idea of the average profit received, that is the margin of receipts over and above, the expenses in connection with those successful factories that have been running in Michigan?

A. I do not think the balance would be very much on the right side. This is only the first year of eight of these factories and the second year of one. I do not think there is a factory that can make a very large showing. I think in California their percentage of profit has been larger, but I do not think there is a factory in Michigan that has made much.

Q. From what you have shown us, if correct, I am satisfied it would be in the interests of the farmers to grow beets, but I think in asking a bonus you should have come prepared with a tabulated statement to show the cost of erecting the factory, the interest on the investment, the cost of the labour for converting so many tons



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of beets into sugar, and strike a balance, then we would have an idea as to whether you were entitled to a bounty or not?

A. I would be very glad to make that showing. I gage you the cost of the factory and the pay roll, but I cannot tell you the cost of converting the beets into sugar until I see what quality the beets are. Beets grown on the Experimental Farms showing high grade. I gave figures showing an average of eight per cent, which is about what we can sell in for. In the United States we can get more money, the price of sugar there is about \$4.90 wholesale.

*By Mr. Hurley:*

Q. Have you had beets grown by farmers around the country and can you get at their value?

A. There is a loss varying from three to five per cent. One hundred pounds of beets will produce 96 pounds of juice. Out of that there are perhaps 16 pounds of solid matter and possibly 10, 12 or 9 per cent of that will be crystalized sugar.

Now the experiments made everywhere before the industry was started, simply proved to capitalists that beets of proper quality can be grown. You get an indiscriminate quality; in the case of one man you will get 16 and with another fellow only 9. With our proposition we take every beet and I do not believe you can.

*By Mr. Clancy:*

Q. Pardon me, I have been following you with great interest. You said a minute ago that the quality of the soil made a great difference in the beet. Suppose you went into a poor locality even where the farmers practised good cultivation, would you be prepared to take beets grown under all circumstances of cultivation and pay the same price?

A. Yes, provided we had our own experts to oversee the growing of these beets. Our own experts cost lots of money, but we have to protect ourselves. It is impossible to make money until we get beets to produce ten per cent, and that has not been got in Michigan yet. Mr. Cargill asked me the cost of plant and outlay; what further information do you wish to have.

*By Mr. Cargill:*

Q. I have been told—I don't know whether my authority is reliable or not—that the actual cost is two cents per pound?

A. I would like to see the man.

Q. I could do that.

A. I would like to make a contract with him.

*By Mr. Henderson:*

Q. Mr. Cargill means that does not include the cost of the beets?

A. Well, perhaps; that does not vary. I gave the cost of manufacture approximately at \$2.60 to \$3 a ton.

QUALITY AND SIZED OF BEETS.

*By Mr. Erb:*

Q. Have you any evidence to show whether the percentage of sugar in a large beet and a small beet varies when grown on the same soil and under the same conditions?

A. Yes, the small beet is the beet grown. The factories desire beets weighing 20 ounces.

Q. Then your experts go around to teach the people to grow better beets, and would get them to grow the small beet?

A. No, because the seed we furnish produces a small beet. Just one minute on that point; I don't think you understand exactly. We advise the planting of the beets in rows 18 inches apart with the beets thinned to 6 inches. Beets thinned to that standard will give 20 tons to the acre. Don't think because we want small beets that we won't take large ones, we take everything that comes.

*By Mr. Wilson :*

Q. That is on the condition they grow your seed ?

A. Many beets that are now grown weigh 4 pounds, and 5½ pounds 5 pounds, but the desirable beet we will eventually get will weigh about 2 pounds.

*By Mr. Erb :*

Q. The first year you are prepared to buy without a test ?

A. Yes.

Q. After that, with a test ?

A. It would depend largely on the farmers. If they prefer to sell that way, we will buy. You cannot drive the agriculturist. We are prepared to make a proposition to buy that way or to pay a flat rate, but the latter way would probably be the most satisfactory.

*By Mr. Wilson :*

Q. Of course every one thinks he has the best crop, and paying by test there will be a variation in the prices paid ?

A. That is so.

*By Mr. Erb :*

Q. Are these factories in Michigan established long ?

A. Two years for one, and for eight others this is their first campaign, but I understand last year was a dry year.

Q. Did they pay according to test last year ?

A. They varied; some make a flat price and others pay for the sugar in the beet.

Q. The reason I ask this is because a neighbour of mine has friends living in Michigan, and they were induced to raise beets for a factory near at hand. The first year they were paid so much a ton no matter what the beets yielded in sugar, but the next year they were paid by test, and I understand from my neighbour that his friends were disappointed.

A. Frankly, I may tell you that I think eight plants in Michigan in one year without any education to the farmers, and expecting to get ten per cent of sugar were anticipations not justified.

*By Mr. Sproule :*

Q. Is it not a fact that in some States they pay a bounty of one cent per pound, provided you pay the farmers not less than \$4 a ton.

A. Yes, but ordinarily that is a condition of the contract which is made with the farmers—in this way your question is all right—there is a reservation made, as to the quality of beets you will take. For instance we would gladly pay \$4 a ton for beets testing 14, and in the States where that law is in effect, that you must pay a certain amount to the farmers, the contract has that reservation.

*By Mr. Macdonald (Huron) :*

Q. Can you give us an idea how much you could pay without a bounty ?

A. I don't think we could buy them. In the first place I think the Government's action—and it should not be taken until it is rehearsed and thoroughly gone

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into—would be an incentive, if you believe in it, to the farmer. It is so in New York.

*By Mr. McNeill:*

Q. How long do you want the bounty to be continued?

A. My suggestion was for five years. It is not an exorbitant bounty, 1 cent a lb.; the United States has given 2 cents and no State has given less than 1 cent.

Q. One cent for five years?

A. Yes.

*By Mr. Rogers:*

Q. If you get a bounty how many plants do you propose to set going in Ontario?

A. It would be impossible without pretty quick knowledge to set any going this year. I have my hand right on the lever that would plant going next November, but it all hinges on this. The matter of seed would have to be cabled for. If I had not my hands practically on this plant I speak of I could not have any going this fall. Recollect this bounty is not paid until we have sugar manufactured.

*By Mr. Wilson:*

Q. Will that one cost half a million dollars?

A. Yes.

*By Mr. Parmelee:*

Q. Where is it to be located?

A. We have received a number of offers. We have simply said to the people that we are at the disposal of the government and we are not willing to come to any arrangement until we know what the government will do.

Q. You are open for offers, I suppose?

A. Oh! yes, for any suggestions of that kind. But I do say, gentlemen, that I have travelled the entire length of your frontier here—and I rode by daylight purposely along the Grand Trunk, and I noticed that the farmers in nine-tenths of that territory believe in fall ploughing. That is the first thing you want in beet growing. You have not to educate the farmer here only to prepare his land, and then in the thinning process teach him how to do that cheapest.

*By Mr. Clancy:*

Q. Did I understand that your inspectors furnished reports to the States where bounties were given; did you say reports were made to the State Departments of the results?

A. In New York they are. We have not made that suggestion or asked that here, because we would prefer to do that here with our own inspectors and instructors from the other side.

*By Mr. Wilson:*

Q. Would they report to the government as well as well as to you?

A. That is for you to decide; in New York State they do.

*By Mr. Clancy:*

Q. Do they expect us to pay them in that case if they report to the Government?

A. That would be left with you, but I should assume that perhaps if you pay the bounty you would like to have all the information possible. I am not dictating, I am just giving you information.



*By Col. Tucker :*

Q. May I ask you if I understand you correctly, that you offer is so much a ton?

A. Yes.

Q. For Canada or for any particular district, or for what limits of district?

A. The limits for the tonnage would not necessarily exceed sixty miles from the location of the plant. Any where within a radius of sixty miles by rail or boat or three and a half miles by hauling district.

Q. Why do you limit the distance?

A. For the reason that we find a great many farmers are anxious to raise beets? And time and again they are willing to draw them as they draw hay, say eight or nine miles, at first. But we have to rely for six or eight years upon the co-operation of the farmers, and I know a farmer can't draw beets that distance profitably, so we draw that limit.

*By Mr. McNeill :*

Q. What section of country are you talking about? Would you say they could not draw more than three and a half miles?

A. I would say so in any section.

Q. Not where there is sleighing?

A. That is a new item that had not come up. I would think on that point with a good team and a double sleigh that there would be no restriction to a man drawing beets eight or nine miles, in fact hay carriers have been anxious to do it in New York State. They figure like this. You give four dollars per ton for beets, an average of fourteen tons per acre, we have received five dollars per ton for hay, we get one and a half tons to the acre. I would like to employ my horses all the winter drawing beets at that rate.

Q. Can you use beet that is frozen?

A. Tons of them have been used.

Q. If they thaw before you get them?

A. No, that would not do. If they are pitted they would not freeze.

Q. Sometimes the farmers get a great many frozen?

A. The question has never come up because we inform the farmer when he should pull his beets. We take the chance of the frost, and when they are frozen we use them right off.

Q. We understood you to say that some companies rent the land and then hire men to grow the crop. What rent do they pay?

A. From three to fifteen dollars per acre. The companies do not do that as much as the local people. Take a city like Ottawa and your farmer within three miles of here if we were located here would contract perhaps for five acres of beets which is all that he would want to attend to and he has seventy-five acres of land which he can't use for beets. If the land is well suited you will find lots of people willing to rent it and make a contract with the factory to grow beets.

*By Mr. Cowan :*

Q. Where do they pay from three to fifteen dollars per acre?

A. All over Michigan.

Q. What part of Michigan?

A. I cannot tell you the exact places.

Q. The manufactory is at Rochester?

A. I know we pay \$15 per acre in New York State for one little plot of land, just a garden plot, I think a fair statement perhaps would be \$6.

*By Mr. Erb :*

Q. It seems to me that if the companies can get land at \$6 per acre, they would rent it instead of giving the farmer \$21 per acre for his beets.

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A. I think that as a matter of fact in the Northwest and in California they have found by experience they can grow beets at two dollars per ton, now if the factory can grow it at that price, the farmer can as well as the factory. In that locality the factories that bought their land do not loose by it, and as I said before, they buy a large acreage of land, colonize it, and raise their own beets. We are not begging the farmer to raise beets and sell them at \$4 per ton; we are showing him he can do this and make money, and if we are in a position located here, we can buy all the beets from him.

Q. My knowledge of business is, that if they can buy land at \$5 or \$15 per acre that would net the owner \$21.00 they would not omit to buy the land.

A. On that point don't take any stock in what I have said. Write to the Agricultural Departments of Michigan and New York State, and here is a list of fifty farmers, you can write to any one of them. Here are the results they have obtained, furnished by the Commissioner of the State of New York, at his request, by the Rome Beet Sugar Company.

*By Mr. Clancy:*

Q. Are these farmers you speak of stock holders in the company?

A. No, they are not. It may prove of interest for comparison as it shows the crops raised by the farmers.

*By Mr. Cowan:*

Q. How do you account for the meeting of the different Farmers' Institutes in the State of Michigan, in Wayne County, in which they passed resolutions saying that it didn't pay them to grow beets and sell them to the Beet Sugar Factories in Michigan?

A. At what price?

Q. At the prices paid last year. That has been done?

A. I can only account for that—I'll tell you. They consider that 60,000 acres are under cultivation in the State of Michigan this season—

*By Mr. McGregor:*

Q. I had the pleasure of going out to Michigan, last spring. It was a very dry spring there, a large proportion of the ground used for growing sugar beet, was of sandy loam, and it didn't pay them well, it being so dry; that was one of the reasons the Farmers' Institute found fault with the results they obtained. I was at the meeting at which that resolution was adopted and it was discussed for some time as to the profits there were in growing beets. They did not all agree that it didn't pay, there were just a few who said it did not pay, but they passed the resolution?

A. They passed a resolution at the Farmers' Institute of Boston, advocating the growing of sugar beet wherever it can be grown. Of course that does not amount to much. I have tried to give you the information as to the results that have been obtained in some cases. I can give you the addresses of these farmers I have referred to and of hundreds of others, and you can write to them if you choose.

*By Mr. McMullen:*

Q. It will be just as well to put the addresses in, so that any person that wants to may write to them.

*By Mr. McNeill:*

Q. I suppose one of the reasons why you want the bounty is just because farmers are disappointed sometimes, and you want to have the industry sufficiently long established so that the farmers may become accustomed to it?

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A. The bounty first shows the faith of the government in the enterprise. It assists us to instruct the farmer to produce what we consider a profitable crop for himself and for us.

Here is a letter from a Michigan man, I think it is in this paper—

*By Mr. Wilson :*

Q. What paper and what date ?

A. The *Michigan Sugar Beet* of Friday, March 2. It is from Mr. Thomas P. Collins, Mount Pleasant, Michigan.

*By Mr. Semple :*

Q. You say beets can be taken sixty miles by rail or water, and that you paid the freight ?

A. Yes, I said that before.

*By Mr. Holmes :*

Q. Have you any knowledge of the business in Utah ?

A. Yes.

Q. Can you give an account of it at the present time ?

A. Yes, I know Mr. Cutler, promoter of the industry there, had a good deal harder time than I have had. There they didn't have the class of farmers we have in New York or here. They were assisted by a bounty, but they have now suspended payment of it.

Mr. Tom Collins here says: 'I am not advocating something that I am unwilling to stand by. I have been a beet grower for three years and have found it just what I thought it was, viz.: a profitable crop to raise, more so than anything else, and I know whereof I speak. During that time I have been learning and working at it on a small scale, having only three acres each year, but at the same time preparing for the future, as intimated in the fore part of this article, and now have thirteen acres ready for the coming season. The first year I shipped to Bay City and realized from three acres, after freight, unloading and seed was paid for, \$155.75.'

How does that correspond with my statement of \$21 net ? It was over twice as much. Mr. Collins goes on:

"Last year I contracted with the Alma Sugar Company two acres, sowed the seed on three acres, and realized after freight, unloading and seed was paid, \$167.68."

*By Mr. Parmelee :*

Q. That is about your figures of \$56 an acre ?

A. Yes.

*By Mr. Erb :*

Q. I thought your company paid the freight ?

A. Yes, but this is in Michigan, where they don't often give the seed. Did you hear the proposition I made that we give the seed and pay the freight ?

*By Mr. Perley :*

Q. Do they pay more for the beets than you do ?

A. They do if they earn more. Here are a number of other cases given if you want them. He gives the name of perhaps ten or twelve people, neighbours, who got as good results. I wish somebody interested would send to Thomas P. Collins and make enquiries.

*By Mr. Cowan :*

Q. Do I understand you that they are paying the bounty in Michigan ?

A. The bounty is in effect, do you know about it, Mr. McGregor ?



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Mr. MCGREGOR—It is before the Supreme Court.  
Mr. WILSON—I want to hear Mr. McGregor.

A PERSONAL EXPERIENCE IN ONTARIO.

Mr. MCGREGOR—I have very little to say. My experience is on the line of practical beet growing. I am a farmer as you all know, a practical farmer. Last year I sent and got one hundred pounds of beets, German seed beet, from New York State. I gave it to the farmers in my district, and in Mr. Cowan's constituency, and grew about five tons of the beets myself. I had those beets shipped to the factory back of Rochester, thirty-five miles. I went to the factory myself; it was a very large establishment which cost about \$750,000. They were producing a large quantity of sugar and doing it much more cheaply than had been previously done in that State or in any portion of the United States. Mr. McMullen said that one of the factories had produced 1.25 of sugar. But this is producing 1.97. Here is a sample of the sugar made from the beets of the seed I produced and grown by myself and taken over there, which produced 1.25 per cent. The people in that district had a very dry season and the beets didn't produce quite as much as anticipated, but nevertheless I didn't find anybody in that district at all dissatisfied with the growing of the beets. Everyone was well satisfied that the factory was running well and giving general satisfaction and there is a sample of the sugar. The chemist in charge said to me, 'if you had sent to France and produced French seed instead of the German, you would have had 14 per cent on the same land. The land this was raised on was a black muck, not quite so strong in sugar as it would have been had it been on a clay loam or a gravelly loam, and it produced about 24 tons to the acre according to our measurement. I am only giving this as a piece of practical experience. I am not advocating anything on one side or the other. The seed was the German seed, the quantity produced was about 21 tons to the acre, the percentage about 12 per cent and the factory producing about 1.98 purity.

*By Mr Bell (Pictou) :*

Q. That is 198 lbs. to the ton?  
A. Yes.

*By Mr. Sproule :*

Q. How much were they paying for beets?  
A. Four dollars per ton.

*By Mr. Beith :*

Q. What size were the beets?  
A. About 2 to 3 pounds.

*By Mr. Bell :*

Q. That 198 means pounds per ton, not per cent?  
A. Yes. They have a way of talking about per cent themselves you know.

*By Mr. Cowan :*

Q. Is there not some advantage in the topping of beets, cutting the tops?  
A. We cut them very low down, just the green part cut off. These beets were only grown with the idea of taking a few to the factory. I thought I would like to see the experiment made with sufficient amount to see how they would turn out.

*By Mr. Cargill :*

Q. What quantity did you send over?  
A. Nearly 5 tons.

Q. Did you pay so much per ton?

A. No, I just asked them to run it through while I was there. It took about 17 hours. I went there in the evening and they ran them out next day.

*By Mr. Cochrane:*

Q. If the beets were large or small did it make any difference?

A. No, they took them all.

Q. No, what is in my mind is if you grow beets larger would they produce more?

A. No, they said it was a nice sample and they didn't find any fault with them.

Q. Don't they usually require beets to be of a certain size?

A. They say the seed only grows a certain size. About three pounds was a good fair size.

*By Mr. McNeill:*

Q. What was the yield to the acre?

A. About 24 tons. We just measured it—these 5 tons of course—running the line down one side and then across and from the measurement estimated it about 24 tons. I was at the factory for a full day and the chemist and general manager went around with me. This is a process in which they use a good deal of lime and it requires a great deal of limestone in the district. It runs along very smoothly and they have a nice way of handling the beets.

*By Mr. Cargill:*

Q. As a practical farmer would it pay well?

A. It would pay well with us. On the land we had, as Mr. Beith will tell you, it would pay a farmer at \$4 a ton.

*By Mr. Wilson:*

Q. How would it do in Ontario?

A. Well, all through.

Q. How would it do on clay land?

A. I don't know.

*By Mr. Semple:*

Q. Was it good land you grew it on?

A. It was a good black loam. It was a large farm owned by the Messrs. Walker at one time and it was bought by myself and a friend. It is a great corn country and as much as 120 bushels to the acre have been obtained there. I have the sugar here if anyone wants to see it.

*By Mr. Cochrane:*

Q. The land does not require manure?

A. No, just general cultivation. There was oats on it before we put in the beet crop.

#### A QUEBEC EXPERIENCE.

The CHAIRMAN.—I understand Mr. Parmelee would like to make a few remarks on this subject.

Mr. PARMELEE.—I do not wish to throw any cold water on Mr. McMullen's proposition, but I think perhaps we might recall to the Committee the experience we had in Quebec with the same industry. I have listened attentively to Mr. McMullen and his plans of procedure and I see that they were exactly the same as

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in Quebec. If I recollect aright this Government, when the factory was started there, gave a bounty of one cent a pound, so that Mr. McMullen has a precedent for what he asks. The Provincial Government also gave a direct bonus. The bonus in my district was \$50,000, extending over five years at \$10,000 a year. A company was formed with very strong capitalists at its head, Mr. A. F. Gault and men of that description. They put up a good plant and had as good a factory as they could have. They furnished seed and instructed the farmers in methods of cultivation and had a good many farmers ambitious to grow beets. They had the thing going on under conditions which promised good success if success could be plucked out of it. There was everything to encourage the farmers to grow the beets if they could be grown at a profit. They had several railways; it was at a railway centre with railways running out in four or five directions so that they had everything in their favour. At the same time—that is 20 years ago now—granulated sugar was very expensive. In spite of all this the enterprise failed. The men who had money in it lost it. As for the farmers the factory considered they could not grow the beets, and prices established there were not \$4.00 but \$5.00 a ton. The experience of the few farmers who grew beets, was that they made a profit out of it but the greater number did not and so dropped it, and every year the factory had to start out and induce a new set of men to grow the beets. That was the experience of that factory. There was another at Berthier backed by capital and experience and another at Coaticook. Now I am not here to say that because that enterprise started in Quebec failed under these conditions—having soil, climatic conditions and railways in its favour—because it failed there I am not here to say it will fail now, but I think perhaps we ought to have these facts before us and I give them to you as I recollect them. I knew these people who owned the factory at Farnham, as it was only a short distance from where I live, and some of my friends were completely wiped out in that enterprise, so I have reason to remember it. Mr. McMullen says the enterprise in Michigan is in the experimental stage yet, that the factories have not reached the stage where they can say it is profitable, and there is evidence that the farmers there, as in Quebec, think it is not favourable. I am not here to controvert Mr. McMullen, who has his facts well in hand and has presented them plausibly and courteously, but my experience is that the farmers of Quebec are not too anxious to grow beets at \$4.00 or \$5.00. They may be wrong, but these are the facts which stare us in the face and we should consider this before we recommend the Government to grant the bounty.

Mr. SPROULE.—Is Mr. Parmelee aware that the same factory is working successfully in New York State and raising beets?

Mr. PARMELEE—I do not pretend to say that it is not, but I am simply stating the facts regarding that factory at Farnham.

Mr. McMULLEN—I am pleased to hear what the hon. gentleman has said. They are all facts I was aware of. But this is a progressive age and we are advancing. The United States went through a worse experience even than that, but the United States and Canada are two countries that never say die and they have learned by experience what is necessary to run a factory successfully. I believe that the farmers were satisfied in the Province of Quebec with the growing of beets, though it was done in a crude way and the factories were run on a very small scale. A factory of 125 tons capacity is not capable of running at a profit, and is sure to fail.

Mr. PARMELEE—This failed.

Mr. McMULLEN—And that would be the result if you started it to-day with the same small plant. We understand this thing is in its infancy and we would rather, if we could get the beets, build a thousand-ton factory than a smaller one. If I thought as you state I would not be here to-day. You have got to make money for the farmer and make money for yourself. My principal argument was to show the farmer can make money, well if he can we can, but we can't do it as quickly as he can. We have no fear of failure in this business if it is satisfactorily located. We cannot go ahead without a bounty, you can see the cost of the sugar plant as well as I can, but we are willing to go ahead and take the chance of failure. If we don't make sugar you don't have to pay a bounty; if we do make the sugar we do it to make a profit,



and if you make a few million dollars in the next five or six years as the result of the establishment of our plant and of similar factories which will follow as a result of our success, it is in favour of the gentlemen who advocate this bounty.

Mr. LEGRIS—I wish to say a few words but I am not familiar enough with the Englishman's language to say very much to my hon. friend who spoke a moment ago and mentioned the province of Quebec. I think it is my duty to answer him. I am myself a farmer and a few years ago I cultivated beets and I have seen their factory at work and at the same time I have seen the farmer at work. I agree with my friend that generally the farmer has not been satisfied, but I am sure that some of them have been satisfied. And if only one of those ten or twenty or a hundred who have cultivated beet have been satisfied, why can not we all reach the same results. I know perfectly well that any farmers in the neighbourhood of Berthier would be very glad to see another manufactory established in their locality. I know perfectly well that the quality of the beet varies and the culture is very difficult. We want many years of study to learn it, and the farmers are not ready at once to cultivate the beet as it should be, but I have no doubt it can be done as well in the province of Quebec as in the province of Ontario and as well as in the United States. Difficulties have occurred at every place where the industry has been established, and many years have been spent by the farmers in learning how to produce beets. I have a little experience in that culture and I have faith that the beet sugar industry will be established in Canada as well as it has been established elsewhere, in the United States, especially.

Mr. SNETSINGER,—One or two words now in reference to Germany. They are shipping sugar to this country that they probably did not receive more than two and a half or two and three quarter cents for. In this country granulated sugar made from beets would command four cents, and with the government bounty you ask, it would be five cents. The farmers should be able to pay double the price they do in Germany and I can't see myself if they can make sugar in Germany for two and a half cents a pound, why they can't make it here when they get four or five cents a pound. I think there is a large margin of profit.

Mr. McMULLEN,—In answer to that if you can assure any factory that you get them a crop of beets equivalent to ten per cent, it will probably reduce the cost of sugar. But you must remember that in Germany they have been in that business for fifty years and those farmers have been educated to grow beets and they can grow them at a profit, at the rates they get there. They do not expect the wages in Germany that you do in Canada or the United States.

*By Mr. Sproule :*

Q. They take out 232 pounds to the ton of sugar there. Whereas we have not been able to get 200 pounds yet.

A. We are getting a very good percentage in the United States.

PROFESSOR WILLIAM SAUNDERS, called.

Said: It is some eight or nine years ago, I think, since I was instructed by the Dominion Government to make a special investigation of this subject, and at that time I visited, I think, all the factories on this continent except the one in California. I visited the districts where they were operating, went among the farmers and saw the process of extracting the sugar from the time the beets were brought into the factory and learned a great deal about the subject. I did not go to California because I interviewed Mr. Spreckles, who was in Philadelphia at that time, and got information from him. We also have a good deal of experience at the experimental farm, where we have experimented with different varieties of sugar beets, that are grown in Germany and France and had the propor-

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tion of sugar in them determined by the chemist at the farm. We have reached the conclusion long ago that there is no difficulty in any settled part of our country in growing beets, containing quite a fair proportion of sugar, as good on the average as they get in Germany or France. The reason why they produce sugar cheaper in Germany, so much cheaper than we can in this country is on account of the large bounty, an indirect bounty, they get.

*By Mr. Wilson:*

Q. How much?

A. It is very hard to tell. It is not shown in any official records in such shape that we can give you the amount, but I will give you the cost.

*By Mr. Parmelee:*

Q. It is an export bounty?

A. The fact that it takes into its hands the manufacture and it is charged six or say six and a half per cent. That is the actual figure I know which prevailed for some time, it is charged a duty of six and a half per cent of sugar, whereas they have really ten, eleven, twelve, may be thirteen and possibly fourteen per cent occasionally, so that the factories gain the difference between six and six and a half per cent of sugar, which they paid duty on, when the beets went into the factory, and they made the difference between that and whatever they could get out of the beets. I believe in France they get up to between eleven and twelve per cent. of sugar on the average from their beets. When the French government found this out, they put a little higher tax on the beets and did not allow them quite as much profit. I interviewed Dr. Wylie of whom Mr. McMullen spoke, and had a long conference with him on the subject, and I think the bounty ranges from a cent to a cent and a quarter at the present time in Germany; in France it is an indirect bounty.

*By Mr. Wilson:*

Q. That has nothing to do with the export bounty?

A. No, when they export the sugar they get the full rebate of the duty on all the sugar they export. And they get a bounty on all this they make just the same as if they sold it in the open market, so that it amounts to the same thing to the manufacturer, but that is where the whole secret, if I may say so, of the business lies, in the difficulty of growing the beets or inducing farmers to grow them, because I think it would pay farmers to grow them at the price the factories pay, although they must have had nearly a hundred years' experience in Germany. In my enquiry I found that sixty per cent of all the beets in Germany were grown by the factories themselves. It shows that the farmers did not take the thing up as we would suppose. If we had this factory established here to make ten million pounds a year, they would draw in bounty one hundred thousand dollars, so as long as the country is willing to pay that, I have no doubt the factory could continue to work and employ a certain number of hands and probably make a profit out of the industry, but the moment the bounty is withdrawn I do not see there is any chance either now or in five or ten years hence, no matter how much the industry may be improved. With regard to the cultivation of the beet or the process of manufacture, because as improvements are made in this country corresponding improvements will be made in Germany and meanwhile the cane sugar people are working for all they are worth to improve the making of cane sugar. They have worked their cane sugar now in West Indies up to twenty per cent of cane sugar in the juice, against, formerly twelve or thirteen per cent. The beet has been worked up from the region of five per cent at which they began in Germany and France until they get twelve or thirteen per cent. The European governments have encouraged the manufacture as much as they can but if they increase the cost above a certain point they give the cane sugar

men a chance and the beet sugar factories are paralysed. Napoleon the First began this industry. He encouraged it as a war measure. He thought if they could produce their own sugar in France they could cripple Great Britain's colonies and these governments have built up this industry by encouraging for so many years that they cannot very well sit on it and abolish the industry, but the encouragement is so managed that it does not appear in the financial records of the country, as so much money paid to any one for this purpose. So long as people don't know it they don't say much about it, and as long as Germany and France are ready to make sugar twenty to twenty-five per cent cheaper than England, and England does not propose to give a bounty, England will buy where it is cheapest.

*By Mr. Sproule :*

Q. After the bounty is stopped, they can continue, if it is a fact, that although the bounty has been stopped in California, the industry is going on still.

A. It is a very intricate subject indeed to get to the bottom of, but the fact that they cannot carry on the industry in either France or Germany without it has been very clearly established to the satisfaction of everyone. Of course in California they have a very long season for growing roots, and can work up a very large crop chiefly on account of the climate.

*By Mr. Holmes :*

Q. As a result of your observations, I presume cane sugar can be produced much cheaper than beet sugar.

A. That is the general evidence in countries where the cane sugar is produced. It is produced by the labour of people who work for very little. I think about twenty cents a day. I gave some particulars about that in my report in regard to the West Indies, where they don't need much food or clothing, and beet producing people have to compete with them in order to hold their place. They have done so at the expense of the French and German people and have put the industry in such a position that it does not seem possible to carry it on in any other part of the world without a bounty. I should be very glad to answer any questions.

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The preceding evidence by Messrs. Charles M. Jenkinson and C. S. Mullen, is a verbatim copy of the Stenographers transcript thereof.

J. H. MACLEOD,

*Clerk to the Committee.*



## BASIC SLAG.

COMMITTEE ROOM, 46,  
HOUSE OF COMMONS,  
March 28, 1900.

The Select Standing Committee on Agricultural and Colonization met this day Mr. McMillan, Chairman, presiding.

The CHAIRMAN,—Gentlemen of the Committee, we have before us for consideration this morning, Bill No. 2, referred by the House, to this committee, on the 15 March, inst. The Bill reads as follows:—

No. 2.]

BILL.

[1900.

An Act to amend the Fertilizers Act, 1890.

HER Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. Section 12 of chapter 24 of the statutes of 1890 is hereby amended by adding <sup>1890, c. 24,</sup> after the word "acid" in the eleventh line thereof the words "and in the case of s. 12 amended. basic slag not less than. . . . units of phosphoric acid."

Sir HENRI JOLY, Minister of Inland Revenue:—The bill is to amend the Act in regard to the proportion of phosphoric acid which should be required in Basic Slag, a fertilizer which is coming into much use. Acting on the advice of the Chief Analyst of my Department I would suggest that the bill be made to read "five per cent of available phosphoric acid." Mr. Domville who is in charge of the bill wants to make it 12 per cent of the phosphoric acid present, without any regard to its availability.

Mr. DOMVILLE—explained the bill and urged its passage in the form in which he suggested it.

Mr. R. G. Brody, Smith's Falls, was heard, who made the following statement:—

Mr. Chairman and Gentlemen,—I happened to be in town on business yesterday and as I am a manufacturer of fertilizers I was asked to remain over until to-day. We have a sulphide works and we have been manufacturers of Canadian Apatites for many years. I have used and known the Thomas phosphate powder since 1888. I have heard what the Chief Analyst has said and I agree that if the new system of analysis is to be applied to the Thomas phosphate it should be applied to all other fertilizers also, because the earth treats them all the same way. If that was done, our Canadian apatites would show a much higher percentage of phosphoric acid. The suitability of basic slag is not altogether in the proportion of phosphoric acid which it contains but in the fineness to which it is ground. We have tried grinding through a 120 mesh wire but that is not fine enough, but if you get floats you can get over five per cent, with floats of Canadian apatites with two per cent of citric acid the same as Prof. Wagner says.

Mr. BELL (Pictou)—What is the total of phosphoric acid in yours?

Mr. BRODY—Between thirty and forty per cent.

Mr. BELL (Pictou)—And only five per cent available?

Mr. BRODY—Yes, with this two per cent citrate treatment. Of course if treated with sulphuric acid you could get the whole of it available. But for straight phosphoric acid the same as this powder, then we, too, should really come in under this amendment because we could get five per cent quite well, applying the same analysis as to the Thomas phosphate.

Mr. SPROULE—Well, if you apply to the Canadian apatite the treatment with citric acid instead of citrate of ammonia would it not show yours higher than to-day.

Mr. BRODY.—Yes.

Mr. SPROULE.—So it would make it more available than it apparently is.

Mr. BRODY.—Yes.

Mr. BELL (Pictou)—You show 38 per cent in phosphoric acid as a total.

Mr. BRODY.—Thirty-eight to forty per cent.

Mr. BELL (Pictou)—But in practice you say only five per cent is available.

Mr. BRODY.—No, you do not understand me. If we treat it with sulphuric acid we get nearly the whole of it.

Mr. BELL (Pictou)—But without sulphuric acid what have you in the apatite?

Mr. BRODY.—Well, there would be probably something over five per cent.

Mr. BELL (Pictou)—The Thomas phosphate powder is not treated with sulphuric acid.

Mr. BRODY.—No. There is naturally far more phosphoric acid in the Canadian apatite than in the Thomas phosphate powder, 40 per cent in the one and 14 per cent in the other.

Mr. MACFARLANE, Analyst.—I suppose the object of the official analysts of the United States and elsewhere has been to get their system as much as possible—to so arrange their system that it represents as well as they know how, the actual results obtained by the farmers. I believe they have done that and in following that system we give to the farmer the best information, on which he can depend. Now with regard to what Mr. Cochrane has mentioned as to the advisability of admitting the material at all, I would say that its effects compared with bone dust—a material that all farmers know and many use, you will find that there is as much of the phosphoric acid in it, soluble in citrate of ammonia, as there is in the case of bone dust, so we would not be doing the farmer any damage, because in proportion to the amount of phosphoric acid, there is as much according to our system of analysis as there is in bone dust, so there would be no danger as we propose to do it.

Mr. SEMPLE.—As far as I know the practical farmers of this country, I do not think they will take any stock in this fertilizer. If it costs \$25 a ton to put it in the ground, will they take the trouble to use it? The farmers generally depend on keeping up fertility by sowing clover and by the use of barn-yard manure. I know farmers who spent \$25 to \$30 a ton putting it on their land and they did not consider it a bit of good. There are no farmers that I know, use this fertilizer now, so I think the farmers will view this with entire indifference. It may help the market gardeners, but the ordinary farmers won't get any benefit from the change.

Mr. COCHRANE.—I understand there is a Mr. Wallace here who has introduced this fertilizer into Canada, and perhaps we might hear him.

Mr. T. C. WALLACE, Toronto.—Mr. Chairman and Gentlemen,—I came here at the suggestion of the editor of *Farming*. I had made up my mind not to take any interest whatever, although I control to-day probably three-fourths of the Canadian sales of Thomas phosphate, and I introduced, or rather I projected the introduction of that fertilizer into Canada, and I have constantly been writing and speaking on this basic slag or Thomas phosphate powder, so I might say something about it. The editor of *Farming* spoke to me some time ago and I gave him my opinion. He asked me if it would be well to change the law. I said that I did not know, but I had faith in our institutions and our analyst. The point is, is there any danger of adulteration of Thomas phosphate powder. If so, there should be some action taken. Now we find Prof. Wagner, of Darmstadt, said some years ago that he found as the price of natural fertilizer, apatite, lowered, the price of Thomas phosphate powder went up, and that consequently there was adulteration. To detect that is very difficult with our methods. He says in his *Manurial Problems*:—

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'Now we have after considerable trouble and time at the school at Darnstadt discovered the manner and have proved it against fruit, by material, showing the different materials against the plant itself in the soil and then analysed it by your system of analysis.' This system was by the use of two per cent of citric acid which forms a citrate of ammonia known as Wagner's method and in that he dissolves it. That is so on account of the large amount of phosphoric acid in it. It is not correct that by using Wagner's method on ground apatite, even on floats, it would give the same results. Prof. Wagner proves it. He says this was used on ordinary phosphates, and by testing them with this solution and his method he was able to detect whether the Thomas phosphate powder was adulterated or not. Now that is not used in Canada to-day—the chief analyst has not seen any need to use it—and it seems to me it has become a question between the users of this fertiliser and the chief analyst, and if there is, as I say, as Wagner has said, a chance of the adulteration of Thomas phosphate powder it would be better to have some way of ascertaining it and I should have been inclined to meet the chief analyst half way on the five per cent, but it seems to me, it seems to be just this way, that if there is absolutely no danger of Thomas phosphate powder being adulterated there is no object if it is the fact that this cannot be adulterated with anything, there is no reason in the world it seems to me, to raise the solubility question at all, but if it can be adulterated, there must be some reasonable safeguarding conditions.

*By Mr. Cochrane :*

Q. Do you think it can be adulterated ?

A. I think it can be adulterated, I am bound to say that. I am speaking in the farmers interest, instead of my own, which would be right with this bill, because it would save me trouble and the cost of a great deal of analysing. There is no question to-day probably as to the use of this powder because of the acid that is in it, which Prof. Wylie of the Department of Agriculture, Washington, says he finds is in an entirely different condition in this powder to what it is in any other fertilizer. Mr. MacFarlane says the Americans have not adopted the European method, very well, he knows a great deal better than I do about that matter, and if they have not adopted it, and if we are following the system they are following, it is pretty difficult to ask the Chief Analyst to change it. For my part I am satisfied that the law should remain as it is, but here is a thing I propose, that I now be allowed to introduce into Canada, the true Thomas phosphate powder, that contains so much soluble phosphoric acid that is available; it contains up to 80 or 90 per cent of phosphoric acid. But whether or not it will show under Mr. MacFarlane's analysis 80 or 90 per cent is another question.

Mr. MACFARLANE.—No, it will not.

Mr. WALLACE.—I think it will not on account of the large amount of caustic lime in it. Is not this the reason, that it has the effect of spoiling his analysis as far as the phosphate is concerned, but it seems to me that after all we get right down to where you will take the point as it is.

*By Mr. Domville :*

Q. May I ask whom you are speaking for now ?

A. I am not speaking for you or the Bill you are advocating.

Q. But I as the promoter of the Bill now, am asking you whom do you represent when you say "if you can satisfy us" ?

A. I would say I am speaking for the Thomas Phosphate Powder Company, as a dealer.

Q. But not for the manufacturer ?

A. I am not speaking for the manufacturer. We have no manufacturers in the country, but I can speak also for the manufacturers.

Q. Give me his name, please ? Who is he ?

A. I am speaking for the manufacturer who supplies us with the material.



Q. Give us his name, please? Is it Albert?

A. No, I am not speaking for Albert at all. They are not the only producers of Thomas Phosphate Powder by any means, although they are large and powerful producers. It is interesting thousands to know just what this powder is and perhaps you can all get a fair idea of how it was produced. In a part of the Bessemer process they have found there is a large amount of calcareous limestone, which is put in with the iron to smelt in the retort. The linings of it are made very thick with dolomite or magnesium of lime, and it is this material that largely takes up the phosphoric acid and it remains in the magnesia. When it is taken into account, that in every thousand parts of wheat there are 128 parts of magnesia, it is seen that this is a very important fertilizer, and there is another important matter to be remembered. If you take some grains of barley you will find there are about 240 or more parts, I think, in every thousand of silica, and we know that this silica is a very important part in the making of straw. The silica assists in liberating some of the potash that may be locked up in the soil. Here is a point that we have found, that is a little bit against what the chief analyst would say, and that is, this, that the slags which are found to contain the largest amount of silica are the most easily soluble, but the slags that would show the largest amount of lime would be the most basic and probably the best slag, but probably in determining them under a solution of ammonia I am afraid they would fare the worst.

I have had a great deal of talk on this subject lately with Dr. Ellis, the public analyst of Ontario. He is very well known and has gone into the subject very deeply, indeed, and his opinion to-day is that he found there were no reasons for the changing of that Act, and he thinks if we have any question between us it is between us and the Department and the chief analyst, who is bound to administer the law as he finds it. This suggestion is to change the law. But perhaps I am wrong in opposing my own interests and leaving myself or my company open to some extent, by not coming to the point of simply saying: "introduce this material just as it is with the amount of phosphoric acid it contains," but as I fear it can be adulterated I propose to stand where I have always stood in this matter in the farmers' interests because in the long run their interest is my interest. I do not think there is anything more I can say on this. I know there are lots of points which might be brought out. We think the Department is using us pretty well in meeting us as they have proposed to do.

Mr. DOMVILLE.—As far as I am concerned as responsible in Parliament for the Bill, I hope that this Committee will decide one way or the other, and that the Bill will be reported to the House because it cannot end here, whichever way it goes. I am very glad we have had such a discussion. We have arrived at what is most satisfactory to the English people. We have had a committee of gentlemen in this House with a large knowledge of farming, expressing their views and asking questions of us and saying what they feel, and the people in England will be glad to know as a result of the discussion that it is admitted by a gentleman here, whose name I do not know, and the chief analyst himself that if it is analysed under the system that exists in Australia, New Zealand, Germany, England, and France, by scientists who are the very greatest men of the age, it would give a different result and it is a matter really that the chief analyst of Canada says I shall not accept and permit an analysis to be made by or through these men who have made it a special study. I have just a word I wanted to get out when we come down to what Mr. Wallace says about adulteration. Of course everything can be adulterated, but I would rather see it dropped than see the five per cent mark put upon it, so that Mr. Wallace or anybody else could say to the farmers, "that is the law; it is all it requires." I would rather never see a ton come into Canada that couldn't stand over a five per cent analysis, either through a chemist, or as Mr. Edwards says, from the soil which is the best analyst after all. As to what they do in the United States the analysis there goes for nothing, for they do not have Basic Slag there and do not analyze it and do not use it. It is too important a question both for the farmer in England and in Canada for us to deal with it lightly. It must stand on its own merits and value and

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if it is not worthy it should never be allowed into this country, but in all fair-play, if these goods carry that value then have they not the right to the imprimatur being put on them, and not to be told "because I have adopted that system or somebody else has you shall not have full value for what you have paid." I would rather withdraw the Bill to-day than allow five per cent material to come in that can be adulterated. We want the material to come in with such a percentage that it cannot be adulterated.

*By Mr. Sproule :*

Q. Are you willing to allow the Bill to go with 12 per cent of 'available' phosphoric acid?

MR. DOMVILLE.—Put in twelve per cent if you like, because we will go to the law courts, the law courts are above Mr. McFarlane and the courts will show that what we have said is correct. The courts will determine the strength of the analysis and whether Mr. McFarlane's analysis or yours or mine is to be taken. It simply resolves itself down to a question of analysis. When you come to discuss it on a five per cent basis in the interests of every farmer here, I should rather never have introduced the Bill, than to put on the imprimatur of the five per cent fertilizer, a fertilizer capable of being adulterated. All we ask is to sell an article in this country, that has the full strength, and we will demand that we shall have an analysis to determine what it contains irrespective of whose corns we tread upon or whose analysis we take.

MR. CARGILL.—We have had a very interesting and instructive discussion but it is not likely to result in any benefit to the farmers of this country. I think if the farmers of this country had a perfect fertilizer which cost \$20 to \$25 per ton, they would go out of business very soon. My experience has been that practical farmers generally make their own manure—either sow clover or keep a sufficient number of stock on their farms to manufacture all the manure they require, and in looking over the country these are the most successful farmers we have had in this matter. I have heard a good deal about this phosphate being a magnificent fertilizer, highly recommended by the people of England who manufacture it. It is used largely by the farmers of England and if our farmers in Canada followed the same lines of husbandry that they pursue in England, Ireland and Scotland, we could not remain on our farms very long. We have to adopt a different system of farming altogether.

MR. MCFARLANE.—I would suggest that Mr. Shutt, the Chemist of the Experimental Farm, be heard. I have been the only chemist talking on the scientific view of the matter and I do not know if it would be wise for the Committee to adjourn without his being heard.

MR. ROGERS.—I agree with Mr. McFarlane. As a practical agriculturist I have had a little experience with different kinds of fertilizers and have not had a satisfactory return for my money. I bought some of this last year, like Mr. Edwards, and cannot say I have any results from it yet. It may give results in the future but I would not invest any more in these chemical fertilizers until I see some more results from this.

MR. SHUTT, CALLED.

THE CHAIRMAN.—We might hear what Professor Shutt has to say in regard to the matter.

MR. F. T. SHUTT.—Mr. Chairman and Gentlemen—Of course it would be unbecoming in me to offer any suggestion or advice with regard to the passage of the bill or the proposed amendment. I come here from another department of the Government service and I am here to present an account of the work carried on in our Chemical department, but since I am asked to contribute something to this discussion, I may say something by way of information, such as will to enable you



to come to a decision. In the first place, I might make a remark brought up by the speaker who preceded me, that is in regard to the value of commercial fertilizers in general. It would be an unfortunate thing if it were to get abroad that the use of commercial fertilizers was not advisable because in some particular case a beneficial result has not been observed. There are many reasons why such results might not be obtained. That particular fertilizer might not have been needed by the soil or the physical conditions of the soil might have been such as not only to retard, but to check the beneficial effect of the fertilizer. Then the fertilizer used might be one which supplied phosphoric acid to the soil when nitrogen was needed. So that general statements of that character will not produce good, because they will bring about a distaste for articles which intelligently used are of great benefit.

Now as this question of the phosphoric acid in basic slag, the Germans, in determining its value, consider two things, the proportion of phosphoric acid in it and the degree of fineness. They not only consider the proportion of phosphoric acid which it contains but the degree of fineness obtained by mechanical separation, by means of sieves containing so many meshes to the square inch, and those who have given the matter thought, contend that its value is in proportion to the degree of fineness; so that if coarsely powdered slag has a return of 60 per cent, very finely powdered slag will give a result of 100 per cent. I am speaking from memory and giving round numbers. This is an important matter, and while I hesitate to speak, I would say that any system which endeavours to arrive at the agricultural value of basic slag, should take into consideration the question of fineness.

The question of the adulteration of this fertilizer has been raised. It can be adulterated. I know there are brands on the markets of the world, which are found to be admixed with powdered substances such as are known as floats. I do not say that it could not be found adulterated with materials in the earth, or that no system of analysis adopted should take into consideration the search for possible adulterants. Now, taking up this question of availability. The matter has been under investigation for years, and they have not yet got at what is available for plants and what is not. We cannot draw any hard and fast lines, for the reason that the power of crops differs in regard to foraging power. We know very well from a large number of experiments that solids of the character known as insoluble are no use, that plant food must be supplied in the form of gas or soluble foods; it must be supplied in a very rapidly soluble form. Now in past years the amount of phosphoric acid, from the fact that it is known by chemists to exist in different ways—half of this phosphoric acid supplied to the land by farmers, is supplied as phosphate of lime—differs in respect to its availability according to its solubility.

In the past phosphoric acid soluble in water was called soluble. Then owing to the fact that phosphoric acid placed in the ground, which is reverted, is not soluble in water but is soluble in citrate of ammonia, and this is more or less of use to plants, therefore this was called available. I am tracing up this history briefly. Further work went to show that phosphoric acid was in most instances as much benefit to the farmer as that easily soluble in water. Now the custom is to take that water soluble and citrate soluble together and call them available. As for the farmer we might try to find what proportion is soluble in citrate of ammonia. It is not whether phosphoric acid is soluble in citrate of ammonia, or this or that, but it is the amount of phosphoric acid that is going to be available for crops. What evidence is there on that point? I have been working on that point for five or six years in co-operation with American chemists, and we cannot yet say definitely whether certain solvents will help.

Some very valuable work was done in 1894, in England, by Dr. Dyer. He went at it in this way: Plant food is rendered soluble from two sources—one the water in the soil, and the other the acid exudation from the rootlets of plants. These are the two factors which tend to make plant food available. The result of that lengthy investigation was, that he found the solvent action of these exudations given out by the plant rootlets was practically equal to a solution of one per cent of citric acid. Therefore, he said: 'if I take the soil and treat it with one per cent of citric acid



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solution, and estimate the potash and other elements, I then have an estimate of the amount of potash and phosphoric acid available for plant use.'

*Mr. Sproule :*

Q. Did they give the same?

A. No, this was an average, but then plants differ in their power of making available the constituents in the soil. I am familiar with the literature on this subject, and that seems to me to illustrate more than anything else the most satisfactory data on record in regard to this availability of plant food, so that we must admit, and I have no doubt that Mr. McFarlane admits with me to-day, that this question of citrate of ammonia is more or less unsatisfactory and it always has been a bone of contention.

Q. Is treating it with citric acid any more satisfactory?

A. I believe it will be, but that has to be determined by carrying on experiments. A change with regard to the methods should not be rushed into. We should have very much more data than we have with regard to those questions, and I am not quite prepared to say that I would substitute a one per cent citric acid for a solution, but a large amount of experimental work is giving us data which show that a one per cent citric acid has a soluble, practical value equal to the rootlets in the soil, whereas we do not know anything with regard to ammonia and water.

*By Mr. McFarlane :*

Q. But you would apply one per cent citric acid solution to all fertilizers without picking out one especially?

A. Certainly. When we once arrive at any solvent which represents as nearly the truth as we can get to the sum of what is available as plant food, we should apply it to all, when we arrive at that point. I have urged these matters on chemists with that end in view.

The introduction of basic cinder has brought before the public a new and altogether different form of phosphoric acid. It is no use going into the chemistry of the matter, but it differs chemically to a great degree from that which is found in bone or our Canadian apatite which is known as tetravick. It is not soluble in water in the same way as phosphoric acid is, neither on the other hand is it insoluble to the same degree as in apatite, so that it is not to be looked upon as in the same condition.

*By Mr. Edwards :*

Q. You mean in extreme insolubility?

A. In extreme insolubility, so that it is midway. I will not say midway with the intention of stating its exact position, but I want you to get a general idea with regard to its solubility, and while it is not soluble in the same sense as phosphoric acid which is the form in which it is in apatite,—soluble under certain conditions.

Now with regard to one point I have put down here. I think there is a suggestion, since withdrawn, of bringing it into line by adding nitrogen. I cannot advise that, because it is and probably always will be, and is better so, that it should be sold as a phosphoric fertilizer.

*By Mr. McFarlane :*

Q. That was only to make it comply with the Act?

A. It contains a large amount of free lime, and if you add a solution of ammonia to that, nitrogen is dispelled and lost.

*By Mr. Domville :*

Q. And the fertilizer would cake up ?

A. Yes, there would be a loss of nitrogen, so that I do not see how that really gets over the question. However, I would prepare a statement if I were making a suggestion. With regard to results we have done something at the farm in the matter of testing practically in the field, this basic cinder, and where phosphoric acid was needed, we got very satisfactory results from its application ; I am not here to say because I cannot quote from memory what these results were, neither can I give you from memory the amount that was used. These are all questions that should be taken into consideration when we have the data.

*By Mr. Rogers :*

Q. Did your results warrant the expenditure ?

A. I do not know that they were figured out from an economic standpoint. I may say for many years in our series of experimental plots, we have been endeavouring to ascertain whether there was any beneficial effect from the application of finely ground apatite and we cannot say there was, in fact we tried the experiment one year of fermenting this with manure and we found that even under these extreme conditions in which the finely ground powdered apatite had been fermented with strongly rotted manure, solvent action had taken place. That was discontinued then, and we used instead the basic cinder, the Thomas silica, and we found there was an increase in the yield showing that the land and the crops had need of phosphoric acid. The question of the comparative value of it in the basic cinder as compared with that in the superphosphate or bonemeal, is altogether too lengthy a subject for me to speak about at the present time. I do not think it would be wise for one to speak hastily upon the value from an agricultural standpoint, but I think these remarks have given you some idea.

*By Mr. Sproule :*

Q. If I understand you, in using apatite or phosphates ground very fine, they yielded no beneficial results as far as you could see ?

A. Canadian apatite.

Q. Why did it not give any beneficial results, the phosphoric acid was in it ?

A. It was not soluble.

Q. Then it is not available ?

A. No.

Q. Is not that exactly what we want to get at ?

A. Yes.

Q. It can be in the slag but not available for plant food ?

A. When you say insoluble it ought to be stated that it may be soluble under certain conditions but it is not immediately available.

Q. It is not ready for plant food ?

A. As far as I can judge now, that phosphoric acid is not available. As far as I can judge it is soluble in a one per cent of citric acid but it is not immediately available for plant use. You notice I use the word "immediately."

Q. Why do you use that word ?

A. Because I am not going to say just exactly how and when and under what conditions of soil it will become available. We do not know. Where does the phosphoric acid in the crops come from if it is not in the soil. Mr. Sproule made an error in saying that the phosphoric acid in the soil is not available.

MR. SPROULE—Excuse me, I never made such a statement or conveyed such a meaning.

A. I certainly understood that you did. What we seek to do when we add the fertilizer is to add available plant food, there are thousands of tons of phosphoric acid in all soils which are cultivated in Canada, but it may not be in an available form for plant food. Natural forces bring in slowly but constantly small quantities

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of plant food, but the object of economic farming is to convert the plant food as quickly as possible into plant structure, and we feed that to the cattle and get it around again. We do not add a fraction per cent to the plant food in the soil, but we do when we use the fertilizer add very largely to that percentage, the very small quantity of it, that is present in an available condition as plant food.

Mr. McFARLANE—I was very glad to hear Mr. Shutt make use of the word 'immediately' available, and I think it is one that we should adopt in our regular bulletins, instead of calling a certain amount of phosphoric acid available, we should say available within the year, for that is really what the farmer wants, immediate results. Although the phosphoric acid contained in Thomas' slag is all ultimately available, the thing is that it should give immediate results, so I think the phrase 'immediately available' is well worthy of consideration and adoption.

*Mr. Bell (Pictou):*

Q. In what way is Thomas' phosphate powder imported to Canada now? How is it brought in if it does not comply with the requirements of the Fertilizers' Act? How is it possible to bring it in?

A. There is nothing to prevent anyone to import any fertilizer. The Fertilizers' Act does not in any way influence the Customs Department. I have very frequently made application to the Customs Department and asked them that only such fertilizers should be admitted as have been previously registered for consumption in Canada, but nothing has been done. They are introduced because the Customs Department allows them just as there is nothing in the Customs Act to prevent the importation of adulterated goods or goods for adulteration.

Mr. DOMVILLE—There is a penalty here.

Mr. McFARLANE—That is for sale, that does not prevent importation.

Mr. BELL—There is no law to prevent anyone from importing as much as he pleases, but preventing him from selling it. It is being sold largely all over Canada.

*Sir Henri Joly:*

Q. How do they sell it?

Mr. McFARLANE—A. They sell it to the farmers direct.

Q. Do they sell it with your certificate?

A. They sell it for what we have actually found in it, certainly.

Q. Then they have a right to sell it?

A. Yes; and if it does not comply with what we have found then the analyses challenge it.

Q. But they have a right to sell for what you found?

A. Yes.

Mr. DOMVILLE—We can show 12 per cent. The only thing we ask is that it should be analysed by Mr. Shutt or anyone else around that will give us what is in it, and if it is not up to the mark that it shall not come in, that is all we ask. I am quite willing to take a sub-committee.

Sir HENRI JOLY—Well, Mr. Chairman, it is well understood that as long as we have a chief analyst we cannot go back on the analysis which he has made. I am very willing he should be helped by others, but I am bound to support his opinion.

Mr. SPROULE—You are right in doing so.

Sir HENRI JOLY—The Fertilizers Act places the amount of phosphoric acid at eight per cent but we make it five per cent in regard to basic slag, which is the minimum our analyst thinks it safe to have.\*

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The preceding under date of March 28th, is a correct copy of the Stenographer's report of the evidence submitted on the matter affected by the aforesaid Bill No. 2.

J. H. MACLEOD,

*Clerk of the Committee.*

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\* For the Committee's report on the Bill, *vide*, "Interim Reports" in the appendix to this volume.





## DOMINION TIMBER LANDS.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
Friday, May 11, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr. McMillan, Chairman, presiding,

Mr. E. STEWART, Chief Inspector of Timber and Forestry, was present at the request of the committee, and being called, made the following statement :—

Mr. CHAIRMAN AND GENTLEMEN,—I hardly know how to commence this morning. This is a new Bureau which is scarcely named yet, and I do not know whether it will be called a Bureau or not.

*By Mr. Wilson :*

Q. In what Department is it?

A. In the Interior Department. The object of course is the preservation of existing timber on the one hand, and on the other, the propagation of trees on the plains will probably be taken up in connection with it. My office is defined in the Order in Council appointing me, and shortly after my appointment I came to Ottawa and looked over the records here and took a list of the timber limits and timber reserves.

*By Mr. Wilson :*

Q. You might as well tell us at the start what your duties are as defined by the Order in Council?

A. Probably the best way would be to read the Order in Council, a copy of which I have here. It is pretty general in one sense. It is dated July 29, 1899, but I did not commence until the 15th of August. It reads as follows :—

"That with the view of preserving the remaining forests upon Dominion lands and Indian Reserves, from utter destruction by fires, and other destructive agencies, and of encouraging the reproduction of forest trees, and as settlement is rapidly progressing in all parts of Manitoba and the North-west Territories, with a view of having an immediate inspection made of the timbered portions of the country, to ascertain what tracts should be set apart for timber reserves before they are encroached upon by settlers, Mr. Elihu Stewart, of Collingwood, be appointed to undertake the work at a salary of \$2,500 per annum, with the title "Chief Inspector of Timber and Forestry," with headquarters at Ottawa, that the duties of the said officer be to inspect the timber reserves in Manitoba and the North-west Territories already defined by the Department of Interior, to visit the timbered portions of Dominion lands with a view of setting apart further reserves, to look into and report upon the cause and effect of fires and suggest the means whereby the destruction of the forest may be lessened, and also any other duties in connection with the timber resources of Dominion lands and Indian Reserves, he may be called upon by the Department of the Interior to perform."

*By Mr. Wilson :*

Q. That simply gives you a salary. It does not say anything about living or travelling expenses, but I suppose you have an allowance for that; will you tell us how much?

A. I have not any allowance. I just charge my travelling expenses when I am away.

Q. Your actual living expenses whatever they are?

A. Yes, whatever they are, according to the vouchers and list.

*By Mr. McNeill:*

Q. Does that include the older provinces—the Order in Council?

A. It includes the Indian reserves in the older provinces only; in the older provinces the local governments have charge of the timber and for that reason it only applies to the Indian Reserves in those provinces. I may say, that so far, I have not been able to give very much attention to the Indian reserves, but will do so in connection with the other work when I go west.

Q. There are some lands which are held in trust by the Indian Department in the older provinces which are settled by white people that are not reserved. Is it your duty to look after them?—surrendered lands in the hands of the Indian Department?

A. I suppose it will, probably, but nothing of the sort has come up yet, but anything of which the Dominion Government would be custodian, would be covered by the Order in Council. I would be very glad to have any question asked, as I did not expect to come up this morning, and had not prepared anything very definitely. I went west, after being appointed, looking after the timber limits and timber reserves and the areas of timber land. I spent the season there until we were driven out of the foot-hills of the Rockies by a snow-storm. I entered British Columbia, went through to the coast; of course as the Committee is aware, the Dominion Government have charge of, in fact, own, the timber in railway belt in British Columbia, which is a district 40 miles in width right alongside of the Canadian Pacific Railway, and it contains considerable timber. I had been through there several years previously, and saw that forest fires were doing a great deal of damage there. I was aware that the forest fires were doing a great deal of damage in British Columbia, in fact forest fires are the bane of the timber in every part of the newer districts as everyone knows that has travelled through them. And that is one of the great points we have to deal with—the protection of timber, if possible, and I suppose I am permitted to say, that one thing I am trying to develop now, is a system of guardianship for the timber in the western territory.

*By Mr. Calvert:*

Q. What arrangement have you made for the prevention of fire?

A. Nothing definite yet as we haven't a grant yet. It would be wise I think to appoint guardians; to divide the country for that purpose into districts and appoint fire guardians, and they would be sufficient with the fire Acts of the Territories. Take the fire ordinance of the North-west Territories for instance—

*By Mr. Wilson:*

Q. You would have an army of officials as bad as the Ontario Government pretty soon if you go on in that way.

A. No, the Crown timber agents already there could, I think, be chief fire guardians and with the guardians employed give ample protection. They might in case it is necessary have men to go out at any time, men that are known to be fitted for the purpose, but they need not be called out every year. For instance, last year it was so exceptionally wet all over the country that it was quite unnecessary to have guardians out, to guard timber from fire.

Q. If you appoint them you will have to give them some kind of salary?

A. Well, I was just going to say that we have an immense territory in the west there, that has not been explored and it is necessary that it should be explored in order to know what we have there, what should be guarded, and what should be set apart as permanent timber reserved for the use of settlers. My opinion was that



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if it was necessary for these men to be kept employed all the time they could be very profitably employed as bush rangers to report on what should be set apart as permanent timber reserves, and what might be allowed to be sold for the purposes of lumbering, and also what other areas it might be necessary to grant permits on, to the settlers.

## EXTENT OF DOMINION TIMBER LANDS.

*By Mr. Calvert :*

Q. Would that include British Columbia as well as the Territories?

A. That would include the railway belt which is all the timber we have in British Columbia. I might say, that I have been engaged during the winter since I have been here, among other things, in trying to collect information regarding the timber of the Dominion. Owing to the large extent of prairie in the west, the general impression has gone abroad that there is very little timber owned and controlled by the Dominion Government; but that is a very erroneous idea indeed. There is a far greater area of timber, land that is timbered, owned by the Dominion Government than there is of prairie. First there is the great northern belt where we find spruce everywhere, right up to the limit of tree growth and which undoubtedly will be very valuable as there is a great deal of it. Besides there is a great deal of other timber in the Peace River Valley between Edmonton and Lake Athabasca, and Mr. Tyrrell reports a large area of spruce is to be found extending to Churchill, in his trip through from Edmonton to Hudson's Bay. Then again a great deal of this information can be found here in the Geological Department, also a great deal can be gathered from the Dominion lands surveys and from various other sources and I am very anxious to be able to collect that and to make a large timber map showing where the timber is. At present it is very fragmentary. I have the Geological maps here and they show the timber; in some cases immense territories of timber, but only in certain districts they have been through. There is nothing collected and I would like to collect this from every quarter and have a large map so as to be able to show what timber we have.

## PROTECTION AGAINST FOREST FIRES.

I may say too, that this season with a view of appointing fire guardians and taking some means of protecting timber in that way I communicated with all the holders of timber limits. I have the letter I wrote them, here and I have their replies. Of course I will not read the replies but I might read the circular letter. The letter is here. I communicated with the holders of limits, ninety-six of them altogether. The letter written to them was:

OTTAWA, February 1, 1900.

SIR,—A number of the owners of timber limits on Dominion lands have at different times requested the Department to assist in protecting them from fire. With this object in view and also to guard the unlicensed timber limits as well, the Department has the matter now under consideration.

In the provinces of Ontario and Quebec the practice of employing fire rangers during the dry months is, as far as the system extends, so satisfactory that no one would now think of abolishing it and it can scarcely be doubted that a system somewhat on the same lines would be the means of saving large tracts from destruction, almost every year in our North-west Territories, in the railway belt in British Columbia, and in Manitoba.

In Ontario and Quebec the cost of the service is borne in equal shares by the government and the limit holders and it is thought that this might be taken as a basis for apportioning the cost of the proposed service.

In many cases one guardian would be able to watch several of the smaller limits and perhaps some adjacent unlicensed territory as well.

In such cases each limit holder would be required to pay a proportionate amount of the cost, the government paying one-half of the aggregate cost of guarding such limits.

"As it appears from the records that you are interested in limit No. in — will you please favour the department with your views in the matter at your earliest opportunity."

*By Mr. Wilson:*

Q. Is that plan of dividing the cost the way they have it in Ontario?

A. No, in Ontario it is somewhat different, but it would not apply there. In Ontario the limit holder appoints or rather recommends the agent or Fire Ranger and it is generally for one township you know. The limit holder recommends some one, very often one of his own men, and the government pays one-half of the expense.

Q. Can you tell me the document I would find that in, where the government pays one-half and the limit holder the other?

A. I am only speaking for Ontario.

Q. It is the Ontario regulation I mean?

A. I cannot tell you where you would find it unless it was changed recently, and generally each limit holder here has one. But in many cases in the west among the foot-hills they have smaller limits and one fire ranger could look over a great many, and also unlicensed timber as well and we would have to apportion the cost so that one-half would be borne by the government.

*By Mr. Calvert:*

Q. What sized townships did you refer to?

A. Generally 36 square miles there, some larger some smaller.

*By Mr. McNeill:*

Q. What would the duty of this fire protector be?

A. The duty would be to have supervision over the territory assigned him. He would have fire notices, copies of the fire Act, to post up in conspicuous places and when the settlers or campers were going in he would warn them to be careful about the lighting of fires and he would enforce the Act. It has been found both in Ontario and Quebec, and I have the Ontario Forestry Commissions report, that this system has saved millions of dollars' worth of timber. I have also a letter from Mr. W. C. Edwards here regarding the effect of it in Quebec and he says that since the adoption of the forest ranging system they have not had one large fire. Another thing is, that if there is a fire a ranger is on the ground and he can give warning and call out a great many men.

*By Mr. Rogers:*

Q. Is there any penalty for carelessness?

A. Yes, each province has its own laws.

Q. Are there any cases of prosecution under these?

A. Yes.

*By Mr. McNeill:*

Q. The trouble with us is that we have to fall back for damages on the man who set the fire, and generally he is a poor man and it is no use suing him.

A. I think there is a penalty, too, is there not?

Q. There may be.

A. I think, of the ninety-six I mentioned, every one was heard from, for very frequently one man owns a great number of them. I think I sent out ninety-six of

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these notices, to every holder and I got sixty-eight replies. I think all of these except six were favourable to the scheme, but it would take too long to read them, but here is one from the Columbia River Lumber Company of Golden, and another company at Vancouver. However, I shall not keep you going over those. One said he would have been happy to have gone into it a couple of years ago, but he had lost practically all of his timber by fire four years ago.

## COST OF PROTECTION AGAINST FIRE.

*By Mr. McNeill :*

Q. From fire ?

Q. Yes. Any person who has travelled anywhere in the west cannot but notice the enormous destruction from fire. In fact, I know of nothing else that has caused as much loss. I have the exact figures here. Ninety-six of these circulars were sent out, seventy-seven replies were received, sixty-eight were favourable, six were unfavourable, two think the government should bear all the expense, and one says his timber was all burnt and therefore it is not necessary for him to do anything.

Q. What was the nature of the objections of these two. It is always well to know what the objections are ?

A. I have one here from Mr. Strathy, of Barrie, whom I know very well and in conversation with him since I think perhaps he has changed his mind, but his limits were near the coast and they never had any fires and so far he thinks their limits being near the coast, where it is so very damp, that it is not so dangerous as farther east.

*By Mr. Clancy :*

I understand that you have suggested that the Dominion appoint fire rangers, one-half of the cost of their service to be borne by the limit holder and the other half by the Dominion ?

A. Yes, the circulars sent out suggested that.

Q. Will you tell us how many provinces have a similar arrangement to that now ?

A. I do not think any two provinces have the same arrangement. The province of Ontario has a somewhat similar arrangement to what I suggest, but as I said that would be scarcely applicable to the limits along the Foot Hills of the Rockies, for there, some of the limits are very small and it would not be wise to keep one man employed on a little limit of perhaps three square miles.

Q. Well, I am speaking of the provinces, I will take British Columbia and Quebec and the province of Ontario ?

A. Well, in Quebec they charge every limit holder—the government appoint their agent or fire ranger there—a charge of 17 cents a square mile for that purpose and make it a tax on the limit.

Q. You do not propose these regulations to apply to Quebec ?

A. Oh, we have nothing to do with the older provinces, the Dominion Government has nothing to do with the timber in the older provinces except on the Indian reserves.

Q. Then the recommendation has nothing to do with the older provinces ?

A. No, and it would not apply to Indian reserves either.

*By Mr. Wilson :*

Q. This would only apply to Manitoba, the North-west Territories and the railway belt in British Columbia ?

A. Yes, that is all.



*By Mr. McNeill :*

Q. The preservation of our forests is a thing of very great value and I would like to see it applied to all Canada.

A. Well, it is a recommendation for the West only.

*By Mr. Clancy :*

Q. Does it apply to British Columbia?

A. To the railway belt in British Columbia.

Q. The lands belonging to the Dominion?

A. Yes.

*By Mr. Calvert :*

Q. What did you say the cost was?

A. I say that the province of Quebec imposes a tax on the limits, of 17 cents a square mile, and the local government undertakes to guard them.

Q. Half paid by the limit holders and half by the government?

A. No, that is in Ontario, in Quebec they charge 17 cents a square mile?

*By Mr. Stenson :*

Q. Do you know if the 17 cents cover the whole expense?

A. No, I do not, but I understand that is the charge there to the limit holder.

*By Mr. Wilson :*

Q. I think in Ontario, if my memory serves me right, there are a great many fire rangers, and the salaries run from \$6 or \$7 to \$600 per year according to their services?

A. Well, there are two classes there—bush rangers and fire rangers.

#### TIMBER RESERVES—HOW SET APART.

I have a list of the timber reserves and parks here, as that is a matter mentioned in the Order in Council of my appointment. I may say for the information of the Committee that there are at present the following timber reserves set apart which are withdrawn from settlement and from the cutting of timber.

Q. For what reason?

A. Well, in the first place they are considered better adapted for the growth of timber than they are for agricultural purposes, and that is a point I touched on before, but I think it is necessary the Government of the country should know what districts are better adapted for the growth of timber than for agriculture.

Now there is the Spruce Woods reserve, south of the Assiniboine River, in Manitoba, and containing 189,440 acres. And there is the Turtle Mountain reserve of 75,520 acres; it is near the international boundary in Manitoba. Then there is the Riding Mountain reserve of 1,215,360 acres, which is south-west of Dauphin Lake, and others.

*By Mr. McNeill :*

Q. These are timber limits?

A. No, timber reserves.

Q. Is that land not suited to settlement?

A. I cannot say, but the purpose of reserving it is because it is more suited for timber growing than for agriculture.

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## AREA OF RESERVES.

*By Mr. Clancy :*

Q. When was that reservation made?

A. I cannot say.

*By Mr. Wilson :*

Q. Have you the kind of timber there ?

A. On Riding Mountain ?

Q. Yes.

A. There is poplar and spruce.

Q. Is it large timber ?

A. There is good timber on the Porcupine Hills, Duck Mountain and Riding Mountain. It may be a matter for investigation whether all this should be reserved. It has been reported that part of this Riding Mountain reserve might be taken up for agriculture, but there are other tracts I think should be reserved for the timber. Only yesterday I was reading the report of one of our surveyors that in one region there, 80 per cent of the land is in timber—poplar and spruce—and he recommends that it be set apart and that settlers be not allowed to go in there. Then there is Moose Mountain reserve of 103,680 acres, which is near Pheasant Rump, Ocean Man and White Bear Indian reserves in Assiniboia. There is Cooking Lake reserve of 109,440 acres, immediately east of Cooking Lake in Alberta.

Q. You might tell us the kind of timber in each case as you go on ?

A. Well, I could not, I have not had time to examine it myself, but I know pretty well the kind of timber. The Moose Mountain reserve, I know, is spruce and poplar. Then, of course, there is the Foot Hills Reserve in Western Alberta, Forest Park containing 34,560 acres near the international boundary line, in Alberta, Louise Lake Park containing 32,640 acres near Rocky Mountain Park at Laggan ; and Sand Lake Park in township 24, range 9, west of the 5th meridian ; the total amount in these reserves and parks being 1,760,640 acres. The American government has set apart in permanent timber reserves something like 6,905,000 acres.

*By Mr. Rogers :*

Q. Are there any persons in charge to keep them from being burned and cut ?

A. Yes, there is some one at Moose Mountain and the reserves are under the care of the Crown timber agents.

*By Mr. Clancy :*

Q. Have there been any destructive forest fires in these localities set aside as timber reserves ?

A. I could not say ; I know in the Riding Mountain Reserve there was a great amount of destruction, and I think in the spruce woods, too, there is a great deal of fire coming in from the prairie.

*By Mr. Semple :*

Q. In these districts is all kind of timber prohibited from being cut ?

A. Yes, excepting the dry timber may be taken on permit for the settlers, and other timber as well for settlers in a limited quantity under permit. Of course it is not a rational policy to keep timber and not take any of it out ; very often it is dangerous to allow dry timber to remain and if the woods are thinned out the trees will grow better.

*By Mr. Gould :*

Q. Is there not a danger of leaving refuse from cutting and hacking which would increase the danger from fire ?

A. Yes.

## PROSPECTIVE DISTRICTS FOR FIRE RANGERS.

*By Mr. Clancy :*

Q. Have you definite information as to those localities where you have made recommendation to have fire rangers ?

A. Well I think the localities would be the whole Railway Belt, excepting a narrow district of 150 miles, called the Dry Belt, in British Columbia, where there is really no timber, it is only this Rocky Mountain pine, *pinus ponderosa*, not of large value. It was considered the rest of the railway belt in British Columbia would require guardians to look after it all through because it is good timber. Then the Foot Hills of the Rocky Mountains would require them. I may say that I took a trip through there last fall. It had been reported by the Chief of the Irrigation Works that there was very great danger of fire destroying the timber at the source of the water for irrigation. I thought it likely that it was so and I went out from the Bow River, expecting to get to Macleod. I was driven back by a snowstorm, but I saw enough to assure me that for the protection of the irrigation works it was necessary these forests should be preserved. If fire should get in destroying the young timber ; a great deal of it is young, and some of it is quite large, we would simply have floods in the spring and drouth in summer and our irrigation works would be no use. So it is absolutely necessary that that portion of the Foot Hills between the Bow River and the forty-ninth parallel should be well guarded.

*By Mr. Wilson :*

Q. Have you any officers with you at the present time ?

A. Well those appointed before me. They became timber agents in the Territories. There are agents, one at New Westminster, one at Calgary, one at Edmonton, one at Prince Albert and one at Winnipeg.

Q. What are their duties ?

A. To look after the timber, they keep a record of all the cutting and the returns from all the mills in the neighbourhood, and collect the dues.

Q. Well these are permanent officers. They have been appointed I suppose quite a while ?

A. Yes.

Q. About what are their salaries do you know ?

A. I can't say.

Q. Have you made any appointment since you were appointed ?

A. Not yet, I haven't had a chance to explore sufficiently.

*By Mr. Calvert :*

Q. Has any arrangement been made between your Department of this Government, and the United States Government in reference to protecting fires starting, say, on the American or Canadian side of the boundary where it runs for many miles through the timber. Don't you think it will be necessary to have something like that done ?

A. Naturally. You see, in British Columbia, that would be a thing for the local government of British Columbia to look after, inasmuch as the Dominion Government have no jurisdiction over the timber along the boundary.

Q. Does not that apply to Manitoba, and the North-West Territories just as well ?

A. What you say would apply to Manitoba, and the North-West Territories, but not to British Columbia, because they own their own timber and land as well, in that province, excepting the railway belt which doesn't go near the boundary.

Q. But in the territories and in Manitoba ?

A. Of course the Dominion owns the timber and lands and they would have to look after it in that case.



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Q. Which is the greater extent of territory ?

A. But not so much forest, of course. There was a recent fire east of Emerson which was near the boundary, and that and the Turtle Mountains are the only parts perhaps where there would be any danger from forest fires from the United States.

Q. In the Turtle Mountain district ?

A. Yes, right through there.

*By Mr. Cochrane :*

Q. Do I understand you to say that one of the officials appointed was in British Columbia ?

A. Yes.

Q. What is he doing there if you have no control over the timber in British Columbia ?

A. He is the Crown timber agent at New Westminster, and he collects the dues from the limit holders for all the timber they cut of, 50 cents per thousand. He also has to keep a record of all that is cut.

Q. But I thought the timber belonged to the British Columbia Government, the timber in the province ?

A. All except that in the Railway Belt which was a donation from the British Columbia Government to the Dominion Government for the building of the Canadian Pacific Railway through that province.

*By Mr. Clancy :*

Q. Are there limit holders in that belt ?

A. Yes.

Q. Have you a recommendation from them also that fire rangers or fire guardians should be appointed ?

A. I read a letter here just now suggesting or asking about it.

## OPINIONS OF LIMIT HOLDERS ON FIRE PROTECTION.

*By Mr. Wilson :*

Q. You read your own letter to them and not the answer you received ?

A. I did not read them because I thought it was taking up too much time.

Q. You might take a sample one for instance.

A. There are one or two short ones here. Here is one from E. H. Heaps & Co. Vancouver. It is not in answer to this letter but I have a letter here, one in which I asked Mr. Leamy the Crown Timber Agent there to see these men and see how they would regard such a proposition as this, afterwards I communicated with them and have their letters which are more or less favourable. Here is one of them, the first on the file.

'SIR,—Referring to my letter of September 14 last, No. 15410 and your reply of the 22nd idem, *re* appointment of fire wardens, I now beg to enclose herewith letters respecting the matter from the Columbia River Lumber Co., of Golden and E. H. Heaps & Co., of Vancouver, dated December 19, 1899, and January 6, 1900, respectfully.' That is Mr. Leamy's letter. He is the crown timber agent at New Westminster.

Messrs. Heaps & Co.'s letters is as follows:—

'DEAR SIR,—Referring to our conversation *re* fire protection, we think the government should take steps to protect the timber by the appointment of fire wardens during the dry months of summer. As the government collects considerable revenue from timber dues we think the expenses should be paid out of the dues. If the costs as has been suggested were divided between the government and the various owners of the limits, and the appointment of wardens be also a joint

matter, we are afraid it might be difficult to arrange a satisfactory scheme. Yours truly, E. H. HEAP & Co.'

The Columbia River Lumber Co., of Golden, writes:—

'In reply to yours of the 7th, No. 15192, file 211, we have not much information in the matter of fire wardens but would say generally that we are in hearty accord with the idea of appointing the right kind of men to look after limited districts in the interest of the government and the limit holders. Provided we have the right to approve or disapprove of the appointee, we would be willing to bear our share of half the salary of a warden for the district which embraces our limits at this end and our share of another in the Shuswap Lake District, provided in the latter case this man is not also required to go down into the Kootenay country as well. We are pleased to see the Government taking the matter up and with the right kind of wardens we think a great deal of good can be done and we will be quite willing to share in the expense.'

*By Mr. Wilson:*

Q. I can quite understand if these who are lumbermen have the nomination of the man and ask the government to appoint him, they will simply be getting one of their own men appointed and getting his salary paid by the government.

*By Mr. Clancy*

Q. Not necessarily so; in Ontario it is the express stipulation that the lumberman must in every case acquiesce in the appointment of the individual.

A. There is another letter from Westbourne, Manitoba from which place Mr. P. McArthur writes:—

'I think that the appointment of active men as guardians, who would as far as possible personally warn all parties camping or travelling through timber lands, that they would be held responsible should they allow fires to get away beyond their control, that this would have a good effect. The principal cause of the destruction of our timber in this province is from people leaving their camp fires without putting water on the ground, around the edge of the fireplace, as the sod in the dry season burns readily, and when the wind springs up spreads to the adjoining grass or leaves. Indians are not any worse in this respect than white men, and all should be warned of the consequences, by the guardian, and the fact that he is known to be around will have a most desirable effect. Should you adopt such a system as you contemplate, I am willing to pay an apportionate share of this protection.'

I have a great number of these letters and I think all but six are in favour of them.

Q. We will not trouble you to read all of these letters, but how many letters have you favourable and how many unfavourable?

A. There were 77 replies, of which 68 were favourable and 6 unfavourable, and two thought the Government should bear all the expense, and one says he would be favourable but he has lost all his timber which has been burned?

Q. Could you say how many fire guardians would be necessary to cover the district for which you made recommendation?

A. It would be very difficult to say, but if the North-West Mounted police were re-enforced they could be utilized, they have been utilized before but their ranks are somewhat depleted now, but it may be necessary to increase their numbers and they might again be utilized.

*By Mr. Calvert:*

Q. Are there not more being appointed?

A. That is what I say. If there are more appointed they can be utilized. They have so many other duties, however, that you can scarcely expect them to do that duty alone. They are amenable to their own officers although they have done a great deal in that way.

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Q. You say they have done that before. What additional duties have they now?

A. They have no additional duties, but often when a fire occurred, they were very good to assist in putting it out, but it is necessary to have some one; an officer in the district, watching has a deterrent effect in making people more careful.

Q. You don't know how many the province of Ontario has now?

A. No I cannot say from my present information.

*By Mr. McNeill;*

Q. Was it from Mr. Edwards you said you had a letter stating the great benefit that had arisen from the measures taken, of the same character, in the province of Quebec?

A. Yes, I have a letter from W. C. Edwards, and Mr. Edwards in the Crown Lands report of Quebec is quoted as saying that since the adoption of the Forest ranging system they have not had a serious fire. I have also the report of the Ontario Forestry Commission in which they state the benefit of the Forest Ranging system in Ontario.

*By Mr. Cochrane :*

Q. But you have no such timber limits in the west as in Ontario?

A. We have not the same kind, we have not the white pine.

Q. They are not so extensive?

A. I would just say this with regard to that. I think the timber area under the control of the Dominion Government is far in excess of the timber under the control of all the provinces. It is not the same kind, it is generally not as large, though in the railway belt in British Columbia, we have the gigantic Douglas Fir, cedar, &c.

Q. I have in my mind the timber limits liable to be overrun by fire in the section of country where people come?

A. They are travelling through a great deal of territory away up even north of Edmonton. My information is that between there and Lake Athabasca, especially since people are going to the Yukon, and exploration parties, fires are being set every where.

*By Mr. Talbot :*

Q. They don't travel through the forest?

A. They travel every where. The proportion of the timber of the Dominion that has been licensed is a very small proportion indeed compared with the whole area, and it is not to guard the timber limits only but the timber outside of that altogether, that protection is needed.

*By Mr. Clancy :*

Q. Do you propose, Mr. Stewart, to have your recommendation apply to just those areas that are now under license and to be borne conjointly by the limit holders and the Dominion or do you propose that and then to include the whole timber areas to which you make a reference on page four of your report.

A. My idea is this, that a timber ranger should have a certain territory assigned him, and in many cases it would include several limits and also considerable timber that is not licensed.

#### APPROXIMATE BOUNDARIES OF DOMINION FOREST BELTS.

Q. In your report you say, 'it would be difficult to define accurately the limits of the various forest belts under consideration?'

A. The following may be regarded as approximately correct:—



The first which might for convenience be called our great northern forest' extends from Alaska on the west to Hudson Bay on the east, and from the North Saskatchewan River and the 60th parallel of latitude on the south to the barren lands of the Arctic regions.

Q. Now, did you propose, Mr. Stewart, to deal with so large an extent of country as that in making the recommendation of fire wardens?

A. No. I was not expecting to include the whole of that territory. It would be necessary to take only what would be in more immediate danger from the travellers going through.

Q. I presume you had in your mind when you made the report some fixed area that you would make the recommendation for fire wardens?

A. Yes, I think I had.

Q. Would you be able to give that to the Committee?

A. The Railway Belt in British Columbia to begin with.

Q. What is the extent of that belt?

A. It is in rough figures about 500 miles long by 40 in width, about 20,000 square miles in area. I mention also the Foot Hills south of the Bow River where the water is being taken for irrigation, also the Foot Hills north of it, the Foot Hills of the Rockies in fact.

Q. What is the extent of this in each case?

A. It runs out into the prairie. Sometimes the prairie extends nearly to the mountains, then probably 20 to 30 miles in different places.

Q. Can you give the Committee approximately what area is covered by timber of some kind?

A. I have a map here from the Geological Survey which gives it better possibly than I could give. If I could exhibit it—

Q. Perhaps it would be better if you could give us the information yourself from having thought it over?

A. I should say roughly it extends from the 49th up to the 54th parallel and would go north of that in fact. You have to go to the 60th to get to the northern boundary of British Columbia, and this extends from the escarpment of the mountains out into the prairie 20 or 30 miles or sometimes more.

Q. Twenty, or thirty, one way, by about how many the other way?

A. Perhaps four or five hundred miles.

Q. What portion of that would be prairie?

A. I am just mentioning what is covered with timber though not with large timber.

Q. That is all covered with timber, is it?

A. More or less, that part.

Q. Well, do you propose to have your recommendation applied to that extent of country you have just referred to now?

A. Yes, that would be the part; it might not go up as far north as I have mentioned, but it certainly should go up to the head waters of the North Saskatchewan River. As I have said, one of the duties of these fire wardens will be exploration work, as we are not in the position yet to say what areas we will have to protect. For instance, the Geological Survey reported some years ago that the recurrence of fires was an important question there, but we do not know what forest fires went through since, but it is certain that immense forest fires have occurred there since. I should mention the forest fires which have occurred where railways are being built. I am informed that there were many in the Dauphin district, though not last year which was wet, and it would be necessary to guard from fire where so many men are at work on railway construction.

*By Mr. Talbot:*

Q. Do you anticipate that this fire protection will be organized this summer?

A. It will depend on whether there is an appropriation for it or not.

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*By Mr. Clancy:*

Q. Well, have you any information, Mr. Stewart, as to whether the destruction of forests in this country was from fire originating in the forests or from fire starting partly in the forest and partly in the prairie?

A. Well, very frequently in the border it will start in the prairie and extend into the woods, and *vice versa*.

Q. It is very difficult to stop it when it gets well started in the prairies?

A. Well, I think perhaps they can stop it better, because they can get a good fire guard far enough ahead of the fire to be of service, but it is different in the woods. In the northern woods there is a good deal of moss and fire often burns there for months. I have heard of fires which started in the fall, smouldered all winter, and started up again in the spring. It is hardly credible but it is so.

Q. There are no limit holders except in that British Columbia Railway belt?

A. Yes.

Q. Where are they?

A. In Manitoba and the North-West Territories there are a large number under license.

## FOREST FIRE PROTECTION IN FOREIGN COUNTRIES.

*By Mr. McNeill:*

Q. Is it a system of this kind that is pursued on the continent of Europe?

A. No, in most of the countries in Europe a very complete system of forest management is in force.

Q. What is the system in India?

A. Well, Dr. Brandis instituted a system there several years ago which now has assimilated closely to that of Germany, by which they guard the timber areas generally and are not allowing cutting of timber in certain sections, and that has been most successful in India.

*By Mr. Calvert:*

Q. A member of the House, not a member of the Committee, wishes to know if you intend to extend that to the Yukon, up to Dawson?

A. My information is that up in the Yukon there is not much large timber.

*By Mr. McNeill:*

Q. In regard to this system in India, do you know what methods they adopt to prevent fire?

A. Well, they have not the difficulty in deciduous trees that we have in coniferous trees, as fire does not catch or run so rapidly with them. For instance, you do not hear so much about fire where you have broad-leaved trees, as in the West where we have conifers. If you have no further questions, I would like to go on to the subject of tree planting.

*By Mr. Clancy:*

Q. Well in order to have this kept together—I do not want to ask unnecessary questions—but in regard to a question put to you as to whether these Rangers would be appointed this year, your answer was that it depended on whether there would be an appropriation?

A. I presume so.

Q. I was not in early enough to hear, but is your recommendation here before the committee?

A. No further than in the report.

Q. Well have you the recommendation you made to the Government?

A. Not here and I do not know whether it would be proper to hand to the Committee what recommendations I made to the Government. They have not acted yet, there has been no action on it.

Q. I am not curious about that part of it, but if an appropriation was made, your recommendation being the basis of it, I asked at an earlier stage how many persons you had recommended, and the particular districts; you were unable to say just then, could you give the Committee that now or at a later stage?

A. That would be a portion of the definite proposal I placed before the Government and I suppose it is in the same position, but I want to be perfectly frank with the Committee. There would be, I think, seven Rangers in British Columbia, about twelve in the Foot Hills, and about eight or ten others in the other parts; that is Fire Wardens, that would be enough with the Mounted Police.

*By Mr. Calver :*

Q. What amount of territory would there be for each of the seven in British Columbia?

A. 20,000 miles is the area of the whole Railway Belt in British Columbia.

Q. And the others in proportion?

A. Yes, somewhat—in the Railway Belt of British Columbia in some sections there is very valuable timber, and it requires much attention, especially in the mining districts it would need to be more closely watched at some places than others.

Q. What portion of the year do you propose they should be engaged?

A. Well, from May 15 or 20, or perhaps June 1 to October, during June, July, August and September, perhaps four or five months.

Q. And they would be engaged all that time?

A. No, I think that might be left with the crown timber agent or the chief warden to say when these men should be called out. In Minnesota they have a chief warden—that is the way they manage it—and his men under him, but they have an appropriation by statute, only to be used in an emergency, and he can call out as many men as he likes to stop a forest fire.

*By Mr. Clancy :*

Q. They are not in the employment of the Government but subject under law to be called, is that so?

A. Well, the fire ordinance of the North-West is the same, everybody with a few exceptions can be called out by the fire warders.

*By Mr. Calvert :*

Q. Who is the chief warden here?

A. We have none.

*By Mr. McNeill :*

Q. Have they found the service valuable in Minnesota, have they succeeded in keeping down fires?

A. Well, I was talking to General Andrews, Chief Warden in Washington, and he told me that if they had not this system in vogue they would have had another fire like that of several years ago. They had one fire and stopped it in this way. I think he told me that was the only time he had to use this appropriation.

*By Mr. Cochrane :*

Q. How much of that timber area or timber zone in British Columbia you speak of, is sold to lumbermen who would come in under the proposition you made a while ago, that they should pay a part?



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A. It is a small proportion, it is generally where it is convenient to a stream that it has been taken.

*By Mr. Clancy :*

Q. Of these seven guardians in British Columbia what number would be maintained by the limit holders or the government, all the seven ?

A. I think that nearly, probably nearly every one of them would be more or less paid by the limit holders, because in certain sections there are a good many limits, and in others of course there are very few of them.

Q. Now the next after British Columbia, you have got through with that. Where is the next ?

A. In the Foot Hills of the Rockies.

Q. You proposed how many there ?

A. I think I proposed—that is not a definite number for I had not considered it; I am expecting to go out there very shortly and the number would depend on the area of timber there and will depend upon what I see when I get out there.

Q. I think you said about 12 would be required there ?

A. There should be I think about 12 in the Foot Hills and in the Edmonton district; I mean the Foot Hills of the Rockies and east of the Foot Hills in the Edmonton district. Others would be necessary I suppose in the Dauphin Lake district, where the Canada Northern Railway is building.

*By Mr. Wilson :*

Q. What salary would you expect to pay these people ?

A. I can't say. I am not prepared to say at present.

Q. You must have some idea, because if you are going to recommend a lot of officers you must have some idea of what it will cost ?

A. Of course we will have in certain localities to pay more than in others. You see our territory extends from British Columbia to Manitoba, and what would be fair wages in one part would not be in the other.

Q. You must have had some plan, some idea, there would be a certain number definitely employed by the year and others partially employed. I dare say some will be employed all the year around ?

A. No, I do not think all the year round, I do not think they could do anything in the winter.

Q. In Ontario is there no one employed all the year round ?

A. No.

Q. They get very good pay for the time they are employed then ?

A. That may be. I think fire rangers and timber rangers are two different officers in Ontario, and one is paid much higher than the other. I think about two dollars per day is what they pay in Ontario to fire rangers, but timber rangers are paid much more.

Q. You would hardly get a man in British Columbia for that ?

A. I think not.

*By Mr. Clancy :*

Q. How many limit holders are there in this district at the Foot Hills in which the cost would be borne partly by the limit holders and partly by the Government itself ?

A. I can scarcely say the number ; I cannot with any accuracy at all.

*By Mr. Calvert :*

Q. You have scarcely had time I suppose, Mr. Stewart ?

A. I have on the maps all the timber limits, but some have been surrendered, and others are being surrendered, and some have very small lots. It is different

altogether from what it is in Ontario. Some men have probably a mile in some cases and some perhaps a half mile, some of them have licenses and some permits.

*By Mr. Clancy :*

Q. In the next place, you have given us two districts, but there is another which you mentioned that you proposed to recommend these guardians for. You have given us British Columbia and the Foot Hills, now where are the others?

A. In the Dauphin Lake district.

Q. How many there?

A. I can't say. That is the first place I intend to visit, and it will depend upon what I find when I get out there. If I find it is not necessary to appoint them I will not recommend it.

*By Mr. Wilson :*

Q. You have an idea I should think from the size of the territory, something near what you would want in the Dauphin district?

A. In the Dauphin district?

Q. I suppose it will depend upon what is being done there?

A. If they push the railway through the timber district it will be very necessary to have some men there. Any one that has gone through British Columbia a few years ago and who goes through there now, and sees the effect of the fires, not necessarily perhaps, caused by the railway authorities, will see the necessity of having fire rangers there.

*By Mr. Clancy :*

Q. Speaking roughly if you can't expect to give the absolute number, I quite understand there should be some elasticity about it, speaking generally, how many do you think would be necessary?

A. In the Dauphin district?

Q. Yes?

A. I do not think it would take in that district, unless the timber area extends further than I think it does, that we would take over half a dozen there.

Q. Are there any limit holders there?

A. I do not think so; but I think there are some under permit, some little portable mills, but I do not think there are any in that particular district.

Q. Now the next district?

A. There is the Moose Mountain district, but there is one there at present.

Q. You don't propose making any addition?

A. No, I think it will not be necessary to appoint any more there.

*By Mr. McNeill :*

Q. There are some limit holders in the Dauphin district?

A. There may be.

*By Mr. Clancy :*

Q. There are some there I am informed?

A. I have not been through that district.

*By an hon. member :*

Q. They are cutting timber all up through that country to the Swan River?

A. There may be some timber cutting, but it is probably for portable mills.

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*By Mr. Clancy :*

Q. That covers all that you propose making a recommendation for now?

A. There may be other districts in which, as I go through, I will find it necessary to appoint them.

Q. It is not proposed to make these permanent officials, I suppose?

A. No, I would employ them temporarily at first until we know what they are. Will I have time to go into the other branch of my subject, of Forestation, now?

*By Mr. Wilson :*

Q. I do not think so?

A. That is one of the most important matters to be taken up.

*By Mr. Calvert :*

Q. That is the tree planting?

A. Yes. At Winnipeg a short time ago I was asked to go out there, and I found that the people there, having the idea that something is contemplated, are exceedingly interested in it. The Brandon and Indian Head experimental farms have shown that trees can be grown there to good effect.

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Having examined the preceding transcript of my evidence, I find it correct.

E. STEWART,

*Dominion Chief Inspector of Timber and Forestry.*







# THE EVIDENCE

## PART II

### IMMIGRATION AND COLONIZATION





## IMMIGRATION TO CANADA.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
TUESDAY, April 18, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr. McMillan, Chairman, presiding.

The CHAIRMAN,—We have Mr. Smart, Deputy Minister of the Interior, before us to-day, who will give us a statement in respect to immigration. We have also Mr. Frank Pedley, Superintendent of Immigration, and if there is any time after the Deputy Minister is finished he will address us. We will now hear Mr. Smart.

Mr. JAMES A. SMART then made the following statement:

Mr. CHAIRMAN and GENTLEMEN,—With the permission of the committee I think that possibly it would be well to explain that Mr. Pedley, who is Superintendent of immigration, is here for the purpose of giving, more particularly, a statement with regard to the last year's operations, to the committee. I will therefore leave for his consideration all matters of administration and statistics connected with that branch of the Department, as well as the general results obtained. If I may be permitted, I will read a short statement which I have prepared on the subject of immigration itself, as this will probably be the means of throwing a little more light on the whole question, and the statements with reference to the practical working of the Department will be dwelt upon later on.

In connection with the development of Canada, the encouragement or discouragement of immigration from foreign lands is a question that ought to receive very careful consideration. The difficulty in doing successful work during the past history of Canada has clearly demonstrated that those charged with responsibility in this connection have no light task. It has been asserted over and over again that it was absolutely impossible to secure settlers in large numbers for Canada, especially in competition with the United States, and indeed up to within a few years ago—at least twenty or twenty-five years—this assumption had been pretty clearly borne out. It is well to decide in connection with the question of immigration, upon two or three points that would naturally present themselves. First, is it desirable to open up our country to the immigration of British and foreign emigrants; is it in the interest of Canada to encourage a movement from outside, particularly in our western prairies? This question being decided, it would appear that the second question is as to the class of persons who should be encouraged to emigrate, and the third, in what countries should the government carry on aggressive work.

Regarding the first question, as to the desirability of population for Canada, the High Commissioner for Canada at London in his report for 1895, said: 'I have no hesitation in saying that I regard the filling up of the vacant lands in Manitoba and the North-west Territories, as well as in the other provinces of Canada, as one of the most important matters that can engage the attention of the government. You know we have been handicapped considerably for some time past in regard to the smallness of the funds that are available for immigration purposes.

'I do hope the government will be able to induce parliament to put aside annually a much larger sum for immigration work, and that an even larger proportion of it may be placed at my disposal, for it is in this country and on the continent that expenditure is needed.'

It is unquestionable that the number of people who disagree with the statements expressed by the High Commissioner in this regard is very limited. One has simply to call to mind the population of Canada as compared with that of the United States—the area of the former being much larger than that of the latter, and its agricultural possibilities to-day known to be equal, if not superior, to any portion of the United States—and to look over the country stretching from the Red River on the east to the Rocky Mountains on the west, and from the American boundary as far north as any settlement has gone into the country, to come to but one conclusion, and that to agree with the sentiments expressed by the High Commissioner that the filling up of the vacant lands of Manitoba and the North-west Territories, as well as of the other provinces, is the most important matter that can engage the attention of the government.

#### EVIDENCES OF VALUE TO CANADA.

To fully appreciate the advantage to Canada of the settlement of the lands in the North-West, one need only look at the total value of the production of those already engaged in agriculture in that country. Up to the present time there has been disposed of by the government in homesteads, in lands granted to colonization companies, to the Hudson Bay Company and in lands patented to railway companies, 16,891,498 acres. In addition to this it is estimated that the railway companies have sold an area of land which, although a portion of the lands grants given to the companies is not yet patented, amounts to 1,600,000 acres, or a total of lands disposed of, of 18,481,498 acres. The quantity of this land occupied by actual farmers can fairly be estimated at 15,000,000 acres, the balance being unsold to settlers and consequently unoccupied, though probably part is occupied by persons who have bought for speculative purposes. It is estimated that the number of farmers at present at work in the North-west would be equal to one for every 300 acres of land disposed of. That would make the number 30,000 for Manitoba and 20,000 for the North-West Territories, or a total of 50,000 farmers in all. Now the production in the North-West for 1899 is not fully known but the latest returns for the province of Manitoba—in which province the government seems to have a very fair system of compiling returns—is as follows:

Wheat.....	27,922,230 bushels.
Oats .....	22,318,378 “
Barley .....	5,379,156 “
Rye, flax and pease .....	389,750 “
Potatoes.....	3,226,395 “
Roots.....	2,670,108 “
Valued at.....	\$21,000,000
Live stock (including horses, cattle and sheep)	2,000,000
Poultry.....	140,000
Dairy products.....	450,000
Or a total product of the value of.....	\$23,390,000

In Manitoba, therefore, the saleable products of 30,000 farmers in 1899 amounted to fully \$23,000,000, or an average of \$750 for each farmer in addition to his food supply. It is safe to say that for each succeeding year not less than an additional ten per cent should be calculated, which will give a total production by each farmer for a period of ten years of \$11,880, a total for the present number of farmers in the country of \$600,000,000 in ten years. I may say that the land prepared for crops in Manitoba for 1900 is 1,492,085 acres, which is an increase of 480,630 acres, equal to about forty per cent over the acreage of 1899.

*By Mr. Cochrane :*

Q. In that estimate the local government has estimated all the grain that the farm produced—did it?

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A. All the grain produced—yes.

Q. And they also make an estimate on the roots ?

A. Yes, grain and roots.

*By Mr. Wilson :*

Q. They estimate an average of \$700 besides living for each farmer ?

A. \$750 besides what they produce for their own food supply.

*By Mr. Burnett :*

Q. For each farmer ?

A. Yes.

## AGRICULTURAL SETTLERS IN 1899.

*By Mr. Cochrane :*

Q. How do you get at the value you give there ?

A. You cannot arrive exactly at that ; you can only take the production and we place the estimated value at the lowest figure, that is if the farmer sold the whole of it.

If these facts be true, and there can be no gainsaying it as the actual facts as to the returns have been given, it is quite easy to understand the importance of peopling a country in which 30,000 agriculturists can make the showing that those in Manitoba have and are doing. It is doubtful if the world has ever seen such progress in any new country, and at the same time it must be borne in mind that the present agriculturists in Manitoba and the North-West Territories have been largely engaged in opening up and experimenting up to within a very recent date. If, therefore, 30,000 people of mixed nationalities can exhibit such progress of what value is the work of immigration to this country for the last ten years ? At a low calculation no less than 10,000 actual farmers located in the West during 1899.

*By Mr. Macdonald (Huron) :*

Q. How many ?

A. About 10,000 actual farmers.

Q. Last year ?

A. Last year. This will, at the same ratio as last year's returns for Manitoba show, add to the wealth of the country to the extent of nearly \$100,000,000 during the course of ten years after the third or fourth year of residence, and one need only consider this fact, too, to appreciate the immigration of some 40,000 people, or say 10,000 actual farmers, during the past year, or even the 7,400 Doukhobors, about 1,800 of whom will become actual farmers on the land. The value to the country in the course of one or two decades of these people cannot be over-estimated, as they come to Canada certified by the British authorities 'as belonging to a community known to be the best farmers in Russia, and a thrifty, steady and law-abiding people, and to have by their good behaviour, diligence and sobriety, and hard-working qualities brought nothing but prosperity to the barren localities in which they were originally settled.' I have referred to this particular class of settlers as there has been some doubt expressed as to the likelihood of their success. The same may be said with regard to the 16,400 Galicians, since whose advent to Canada reports from persons who have a knowledge of their condition clearly indicate that they are not less ambitious nor likely to be less successful than other settlers of the west. Who can value, therefore, the wealth-earning capacity during the next ten years of between 4,000 and 5,000 of these Austrian farmers or of the large number of agriculturalists from Great Britain and also from the United States ?



## IMMIGRANT CONTRIBUTION TO THE GENERAL WEALTH.

The direct value to the general wealth of Canada will be found in the purchasing ability which the wealth from the soil will produce under the instrumentality of the people in the purchase of their building material, implements, furniture, and household utensils, as well as all the various other commodities; in addition to this the payment of wages to women and men who will assist in adding to the wealth of the country, in the production of the soil, or in the harvesting the crops of golden grain, or in caring for the various kinds of live stock. Manufacturers, merchants, and working men in all parts of Canada will receive much advantage from the occupation and cultivation of soil which is certain to show a steady increase year by year, not only from the incoming settlers, but from an increase in the production of those who are now settled in the country. The policy of the Department has been based upon the assumption that it is highly desirable that at the earliest possible moment all the fertile lands of the west should be located, and the country enriched by the general production which will be sure to follow the settlement of a hardy class of settlers. The policy has been to offer every reasonable inducement to agriculturists of Great Britain and Ireland, European countries, and the United States to come and join in the development of the unused fertile lands in the west. The question is, is it wise policy, more especially in view of the remarkable success attending the efforts of the Department during the past two or three years, and is the government warranted in continuing and extending its work in this direction? On the other hand, would it not have been a cause for much complaint if, in view of the results which have been given as to the value of the present settlers to Canada, if the Department had relaxed its efforts to secure for this country desirable and experienced settlers to come and make their homes in the western prairies, if such were procurable either in the United States, Great Britain, or from European countries.

I may say in connection with the settlement of the West that I have had prepared for the report of the Department, and I thought it would probably be of some interest to the members of the Committee, and have therefore brought samples, two maps showing, first, the area of the various districts in the North-West, the area under crop being marked, and second the area settled. It may be of some interest to the members and if it is I will be glad to have the members of the Committee take them for their information.

It is safe to say that were that great territory but half occupied, it would be almost unnecessary to make a computation to prove that the Canadian North-West would, with its well-known productiveness, outstrip almost any country in the production of grains, roots, horses, cattle and other live stock and dairy products.

In answer to the second question as to the class of immigrants I may say that it seems to me there can be but one answer and that is to encourage the immigration of *none but agriculturists*. The other class no doubt will take care of themselves. Canada's great industry being agriculture, her policy is to secure farmers in order to develop the agricultural resources of the country. As to the third question there may be some difference of opinion, but it must be answered by asking where can the best agriculturists be had. Most Canadians naturally concede that the British immigrant is by far the more desirable if it is possible to secure him, but the difficulty is, that in Great Britain, especially in England and Wales, it is said that there is only about one million people all told, who are engaged in agricultural pursuits.

By Mr. Cochrane :

Q. How many did you say?

A. About one million and that is out of a population of twenty-eight millions, I think, and that is only between three and four per cent of the total population. It is very clear that, even if Canada desires her resources developed by the British farmers, it is impossible to secure any great population from that country to do it. It is therefore necessary to look to other countries.

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## COMPARATIVE VALUE OF IMMIGRATION FROM THE UNITED STATES AND OTHER COUNTRIES.

Next to the British settlers—if not equal or in some instances superior, as desirable and of a class most likely to succeed well—are the people who have had experience in farming in the United States, the general conditions and customs being so similar to our own. The greatest efforts of the department have been put forth in the work of directing the attention of the farmers of a number of the Western States to the great agricultural resources of the Canadian West, with a view to encouraging their removal to Canada. The result is now well known. By a policy of judicious advertising and personal work by the agents of the government here, before unknown, fully 22,000 people have located during the past three years in Manitoba and the North-West Territories, and no settlers of the country are more contented, happy and prosperous. This is a nucleus for further additions, and for many years to come we may expect the influx to continue. Nothing will be left undone by the Department to keep the movement alive.

## GERMANY.

Germany is largely an agricultural country, forty per cent of the population being farmers. The restricted emigration laws practically close their country to any effort on behalf of Canada, although some Germans have come, practically without any direct effort on the part of agents. I may say there have been a number of suggestions made as to how the work can be carried on in Germany, but up to the present the Department has not felt justified in taking any active steps to secure immigration from Germany, as the government of that country objects very strongly to the emigration of German farmers.

*By Mr. Wilson :*

Q. Does the government of Germany officially take cognizance of these matters ?

A. Yes. You will remember something like a year and a half, or two years, ago Lord Strathcona visited Hamburg and the German Government at once assumed he was there in connection with immigration matters, and it resulted in some international trouble between the governments of Great Britain and Germany; but it was found that the High Commissioner was not there on immigration work and the matter was allowed to drop. But the trouble in connection with any effort on the part of this government to secure immigrants from Germany, is that international complications may arise. It has been suggested that this would be a bar to any active work being done in Germany by our agents.

*By Mr. Cochrane :*

Q. How long is it since that restriction was placed there ?

A. I fancy it has been there for a great many years.

Q. I don't know, there are a great many Germans in Ontario and they are quite prosperous. How did they come out ?

A. I do not know about that, but probably some members of the Committee will remember that on one occasion an agent of Canada went to Germany and he found himself in gaol for about six months and it was only with some difficulty he got out.

## BELGIUM.

In Belgium nearly 50 per cent of the population are agriculturists and the department is pushing its work in that country and with good results, but Belgium's total population is comparatively so small that no great numbers can be expected of that nationality.

*By Mr. Wilson :*

Q. But the Belgian people are not particularly farmers, are they ?

A. Yes, 50 per cent of them are farmers.

Q. Is that so—Belgium ?

A. Yes.

#### SWEDEN.

A fair percentage of the population of Sweden is agricultural, but restrictive laws, and a general tendency towards the United States where Swedes have been highly successful and occupy many prominent places, have been difficult to overcome. Canada has been able to secure a good beginning of these settlers but not in large numbers. I may say that each year there are a number come out and we have a Swedish agent working among the Swedes in the United States, and he is also in correspondence with Swedes in Sweden, and a considerable number have come out through this agency, but it is almost impossible to do much work there. At present the report comes that in the commercial and mercantile pursuits there is so much activity there that every man is probably better off, at least he thinks he is, than he would be if he came to a new country, and there is little chance at present, during these good times in Sweden, to expect very much in that country.

#### RUSSIA.

In Russia the government is not only determined to prevent emmigration by legislation, so far as active propaganda by Canada and other countries is concerned, but positively prohibits its subjects from leaving her shores.

It is quite true that in special cases to individuals belonging to religious sects passports have been issued, and even in these cases the passports have not been secured without much difficulty, and even then only after bringing influence to bear on the authorities. Among these may be mentioned Mennonites, Doukhobors, German Baptists, sects of Southern Russia, all of whom have suffered much persecution and were only too anxious to leave the country and move to one where they might obtain liberty of conscience to worship God according to their convictions, and in no country in the world is civil and religious liberty so maintained and exemplified as in the Dominion of Canada, hence they choose Canada as their future home.

The work of inducing settlers to come from Russia, while reasonably successful, is so circumscribed and difficult that all negotiations and arrangements must be made on the outside. To a fair degree Canada has achieved some success, but the work amongst desirable classes in Russia has only begun, and within the next two or three years will be greatly extended.

I may say that last year we sent from the Alberta district the Rev. Mr. Meulley, a German Baptist minister, to Russia, I think to Southern Russia. The German Baptists while they sail from Northern Russia, I think all reside in Southern Russia. These German Baptists moved over to Russia a hundred years ago, and are said to have suffered greatly from persecution in the way of having their churches burnt down and other injuries, and a great many have gone to the United States in large numbers this year, I understand. We sent this gentleman over last year, and he was the means of bringing over 500. Since he came out, however, it seems he has had a call to the United States and has removed to the other side, although he writes us that he is still interested in these people going to Alberta, because he believes they will have a better chance to succeed.

*By Mr. McLaren :*

Q. Some are going away from Canada—are they not ? I saw an account of their going to the United States ?

A. That is the Doukhobors ?



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Q. Is it true they are leaving up there ?

A. There are nineteen. I may explain in connection with this that last year reports were sent out that the Doukhobors were in great need. That was last fall. The result of it was that a Russian who lived in California for a number of years, and I fancy occupied some prominent position in a railway in that State, undertook to effect a movement amongst the Doukhobors from Canada to the United States. I do not know whether he really believed they were in want, but he came over to the North-west Territories. I might explain this, too, that after the Doukhobors came last year, a number of Russians arrived in Canada, who were not Doukhobors at all, and one or two of these turned out to be Nihilists or Anarchists, and whom in concert with the man already referred to, from California, they encouraged the movement of about nineteen people altogether, men, women and children. About two or three weeks ago they started. The Northern Pacific Railway, I think, gave them some reduced transportation. The Canadian Pacific Railway refused to do anything for them, and when they got to the boundary at Pembina they were stopped and the Northern Pacific Company were ordered to return them to Canada. They brought them across the line at Emerson, and they are still at Emerson.

*By Mr. Gould :*

Q. Was there something in the American laws that prevented them from entering ?

A. I presume so.

*By Mr. Wilson :*

Q. No, they were going out under contract, I understand ?

A. Yes.

Q. I suppose you noticed an article in the *Toronto Globe* in which it said thirty had already left, and there was a movement, and that they would all go inside of two or three years ?

A. I didn't see that.

Q. That was in the *Globe* ?

A. That is most ridiculous, because I can tell the Committee that Count Tolsti who has been chiefly instrumental in the movement of these people from Russia to Canada, Mr. Toherkoff, the Russian exile, rather a wealthy man in England, Mr. Aylmer Maude and Mr. Bole, of the Society of Friends, as well as the Society of Friends at Philadelphia, who have assisted them, are strongly opposed to their leaving. Even the Americans have written strongly advising them to remain where they were. These people have had no chance to see what they can do. They are the last party.

*By Mr. Featherstone :*

Q. That is, the American Friends have written ?

A. Mr. Elkinton of the Society of Friends. There are only 19 Doukhobors in this party altogether outside of these Russians, only 19 actual Doukhobors. But they are still in Manitoba.

*By Mr. Cochrane :*

Q. How do you account for that that a Russian Nihilist would have any influence over the Doukhobor who has strong religious views.

A. I cannot account for it at all unless Doukhobors are unlike other people and have a few black sheep amongst them.

To a fair degree Canada has achieved some success in Russia, but the work amongst desirable classes in that country has only begun and within the next two or three years will be greatly extended. As Finland in Russia sent about 12,000 to 15,000 to the United States during the last two years, it is almost certain that with proper attention the stream of emigration from Finland will turn to Canada.

In connection with this I may explain that last summer a delegation came to Canada from Finland composed of three very prominent gentlemen, one the proprietor and manager of a very large newspaper, the other two being simply philanthropists. They visited not only Newfoundland but Canada and the North-west. It would appear that Newfoundland did not impress them as being a suitable field for settlement, and they went through the North-west to the Red Deer District, and after inspecting it, decided that this district was one where they could strongly recommend their people to move to, and they went home and made their report. I may say that these people are strongly opposed to the Russian Government. That may be the reason why they are encouraged to this work, that is they desire that the people should be relieved from the control of the Czar and his Government, their purpose being that if the people come to Canada they will be free.

After they had gone, another delegate came representing Mr. Krogius, the largest steamship agent and manager in Finland who practically controls all the steamship business there. His agent, Mr. Wiltelman, said 12,000 were sent to the United States. He visited the North-west and informed me he was simply delighted with what he saw. He was there at a very favourable season of the year and saw a number of Finlanders settled there and they were all well pleased with the country. He said he would report to Mr. Krogius that Canada was exactly the place for Finlanders engaged in agriculture to emigrate to.

*By Mr. Cochrane :*

Q. Of the Galicians and Doukhobors which do you consider likely to be the best class of immigrants ?

A. The Doukhobor has not had the same chance that the Galician has. Up to the present there is no doubt that the Galician has shown himself to be a man who will make a great success of farming work in the North-west. The Doukhobor has not had a crop yet, but many Galicians have been there and farming for three or four years, have had a number of crops and raised a considerable amount of grain and they also raised a good deal of stock. Many of them have shown themselves to be quite as prosperous as any other class in the community. They are very careful, they spend nothing if they can help themselves—of course they have not much to spend—and they are anxious to succeed. The Doukhobors it is true, have not any chance to show what they are possessed of or what they will do, but the reports I have read this morning from British authorities show that in the past in Russia they have done well and there is no doubt, therefore, that they will succeed in the North-west.

*By Mr. Wilson :*

Q. How do their neighbours like them ?

A. Well you see they are largely in colonies, not like the Galicians.

Q. I look on that as a misfortune ?

A. They are not all in the one place. We have now five or six colonies, but they are scattered over different parts of the country.

*By Mr. Gould :*

Q. But still there are a few other nationalities with them.

A. Not at all, they are on the outside.

*By Mr. Calvert :*

Q. How many townships do they occupy ?

A. About twenty townships.

*By Mr. McLaren :*

Q. I saw in a Shoal Lake paper that they were murderers, robbers and thieves and all that ?

A. That was contradicted.

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*By Mr. Calvert :*

Q. They have not had any murders since they were here ?

A. The Doukhobors, not that I am aware of.

Recently the Czar of Russia has directed the passage of an emigration law in Finland which may hamper our work there. It is also noted that since so much attention has been directed to Canada recently in his Dominions, the Czar through his government of Russia is about to establish a Consulate-General for Canada. It was reported two or three month ago that he intends to establish a Consulate-General at Montreal, and this is no doubt to watch the course of events in emigration matters particularly. The agricultural population of Russia is about forty-four per cent of the total.

## FRANCE.

In France we have also done considerable work and I may say that it is up hill work there, for, as is generally known, the population is practically stationary and the work of French emigration has not shown the best results, nor is it likely to do so. Frenchmen in France seem to prefer the homeland, and a movement of great numbers can hardly be expected from that country, although forty-seven per cent of the population are engaged in farming operations.

## AUSTRIA AND HUNGARY.

These countries show the largest proportion of farmers of any continental countries, there being about 24,000,000 out of a total population of 42,000,000 or 43,000,000. Restrictive laws are also enforced in Austria and Hungary, but to a limited extent. In the overcrowded districts the Austrian government permits the agriculturists to emigrate. The so-called Galicians are Austrians, and it would appear that so long as the Government of Austria will permit it Canada, now that a few thousands of this nationality have emigrated to this country and have been successful, will probably receive a share of those leaving Austria. South American Republics have also been bidding for them and many thousands have gone there, and if any restrictions are put on their immigration by this country the Austrian Government will stop all movement to Canada.

I may say that two or three years ago we did attempt to restrict it, and as soon as it was known the Government communicated with their consul at Montreal who visited Ottawa, and wished to know on what ground the Canadian Government acted in restricting immigration. The Austrian Government reported these people as good, law-abiding citizens and they did not see any reason why any country should undertake to prevent them from emigrating to it.

*By Mr. Wilson :*

Q. What restrictions were you placing on them ?

A. We undertook to say that a Galician on arriving at Halifax or any seaport town should be possessed of a certain amount of money, and if he were not the steamship company would have to take him back. After consideration the Government decided to withdraw the restriction altogether.

*By Mr. Calvert :*

Q. You gave them some assistance, those who did come ?

A. The Galicians.

Q. Yes ?

A. No, only in cases where we feared that there might be destitution or something of that kind. There were a few who were really in want and we had to provide flour and other things for them. The Galicians are all on the land now and in these cases we charged this aid up to them.



*By Mr. Cochrane :*

Q. How much land do they get ?

A. 160 acres. The whole amount of aid given in this way was about \$6,000.

*By Mr. Calvert :*

Q. Each son over 21 gets 160 acres too, I suppose ?

A. No, each son over 18 years of age.

*By Mr. Wilson :*

Q. How many are there here ?

A. There are about 16,000 in the country, and we distributed \$6,000 among them.

Q. That is not very much among that number ?

A. Very few needed help. I may say that the other day I was on a train in Manitoba with a gentleman from Emerson. There is a colony on land 20 miles east of Emerson in a district which was settled by English people 25 years ago, but many of the farms were abandoned. He told me that it was remarkable to see the great difference in the little towns of Emerson and Dominion City made by these people. Though they had little when they started, they had made a great deal of money either by farming themselves or by working out, and they had added much to the business of these towns, although they had settled on lands which had been abandoned by English settlers.

*By Mr. Featherston :*

Q. What was the reason they abandoned the land ?

A. I do not know, but it was abandoned.

Q. Was it bad land ?

A. Well, the land was a little low and wet, and perhaps it is drier now than when first located.

*By Mr. Wilson :*

Q. Are the habits of the Doukhobors like those of the Mennonites, who want to make everything themselves ?

A. Yes, largely, the Doukhobors are the same. They make their own shovels, spades, boots, clothing and all that; many of them are blacksmiths.

Q. They live very economically ?

A. Very carefully.

*By Mr. Campbell :*

Q. They will get over that in time ?

A. I have no doubt that after rubbing against Canadians, they will change their habits.

*By Mr. Gould :*

Q. Was there much destitution among the Doukhobors; I have had letters from friends saying there was ?

A. Well, no, there has been no destitution at all, because we prevented it. Wherever we saw there was a danger of their being short of food we sent in flour.

*By Mr. Featherston :*

Q. There was a collection made at Toronto and other points, did they get that ?

A. Yes. I think myself that the work, while it may be all well meant, is a mistake on the part of newspapers or so-called philanthropists. After all, it

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amounts to very little, and the people will be more apt to be self-supporting if left to themselves, and if actually necessary the Government can do what is necessary.

Q. There must have been some solicitation from some person out there that they needed help?

A. No. Any of you may have read; there is one correspondent in the *Globe*—Lally Bernard—who has written a great deal about the Doukhobors; and I think to her may be attributed the most of the solicitations on their behalf. She visited them last summer and of course any one in Canada going amongst 7,000 freshly arrived immigrants and seeing them, as she saw them, will come to the conclusion at once that they are probably destitute, while, as a matter of fact, many of these people had considerable money.

*By Mr. Gould:*

Q. I saw by the papers that some of them had been working on the railways—at fair wages, I presume; the letter I received contended that the railway people had not treated them very fairly?

A. That was reported too, but I do not know that there was anything in it. I know they made a very considerable amount last summer and last fall on railway work.

*By Mr. Sproule:*

Q. Could you give us any information as to what extent they were assisted last winter?

A. This winter, you mean, I presume?

Q. This winter.

A. I cannot tell you that.

Q. Do you not know anything about the amount expended for that purpose?

A. No, not yet. The accounts are not yet made up, but it amounts to very little.

Q. Have you the amount for the winter before?

A. Yes, we can give you that.

*By Mr. Wilson:*

Q. It was \$6,000 I think you said?

A. No, that was for the Galicians.

Q. Oh, it was not the Doukhobors?

A. No. The Doukhobors had the first winter to be helped a great deal more than they were this winter, in fact this winter they have been assisted but very little, they earned a great deal of money and have been able to pay for any supplies they required.

Q. Can you not give us what you spent last year?

A. I think, in round figures, we have not the accounts yet; you see, all the bonus that we gave, in lieu of steamship agent's bonuses, was paid over for their assistance and I think they cost us probably, in addition to the bonus and what we paid out in connection with their immigration, about \$15,000.

Q. I suppose this will all be in the report?

A. No, I say the accounts are not all in yet.

Q. But in last year's report?

A. No, the whole thing will have to be brought into this year.

*By Mr. Gould:*

Q. It will all come in the report of this year?

A. Yes, in the report of the present year.

*By Mr. Wilson:*

Q. But we will not get that report for another year?

*By Mr. Sproule :*

Q. Am I correct in understanding that the support you gave them was about \$15,000 ?

A. Their cost was probably about \$15,000 more than the bonus.

Q. The bonus that you gave to the steamship companies ?

A. At that time we had a policy of granting a bonus to the steamship companies of so much for each immigrant, as most of the members are aware. In connection with the Doukhobors there was no steamship bonus paid, but we agreed to pay the amount usually allowed for the steamship companies, which was £1 for each person, as there was no other expense incurred by us in connection with their movements and that amounted to about \$36,000.

Q. Who did you pay that to ?

A. We paid that in to the credit of a committee in Winnipeg which bought supplies for them, whatever they needed, and that \$15,000 that I have spoken about is in addition to that bonus. Whatever amount there is, however, above the amount of the bonus to which they are entitled, it will be charged up against their villages, there being three or four hundred people in each village.

*By Mr. Wilson :*

Q. The whole community will be responsible ?

A. The whole community will have to be responsible.

*By Mr. McLaren :*

Q. Who are the committee ?

A. Prince Hilkoﬀ, Mr. Archer who is representing the Society of Friends, or the friends of the Doukhobors in England ; Mr. McCreary, Commissioner of Immigration ; Mr. Bole, wholesale druggist ; and Mr. McCaffey, manager of the bank.

*By Mr. Cochrane :*

Q. Do we understand that the Government paid no money to the Doukhobors but only to the committee ?

A. That is the way it was done. No cash was paid to them at all.

*By Mr. Calvert :*

Q. Was any portion of that amount paid to the steamship companies ?

A. Nothing was paid to the steamship companies, they arranged all their own transportation themselves. There was an additional expense, however, in connection with their landing which the Government had to assume, as the Government was responsible in compelling them to pass quarantine at Halifax, although their arrangements had been to land at St. John, but it was only a small amount.

*By Mr. Cochrane :*

Q. This committee expends that amount as they see fit ?

A. Yes, in the interests of the Doukhobors. In fact their work is practically done.

*By Mr. Calvert :*

Q. The Doukhobors have special representatives on that Board ?

A. Yes, they have two, Mr. Archer and Prince Hilkoﬀ. Prince Hilkoﬀ is away just now, but Mr. Archer is there ; however, the committee's work is practically over.



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*By Mr. Sproule :*

Q. This cost does not include the cost of the travelling agents?

A. No, because they are looking after all the other settlers at the same time.

Q. But you had one sent specially with the Doukhobors who went through from Halifax at the time they were selecting their land?

A. Prince Hilkoﬀ who was looking after their interests did that, and we allowed him \$45 a month for expenses.

Q. What salary did you allow him?

A. He had no salary, but his expenses were allowed him, and they were about \$45 per month.

Q. I fancy those expenses would run pretty high because he has charged in his expenses wherever he has gone for his insurance, and everywhere he went he charged four meals a day, and also charged 50 cents for his lunch.

Mr. PEDLEY.—That of course was when he was travelling on the train.

*By Mr. Sproule :*

Q. You take lunch at Carleton Place, for instance. I see 50 cents is charged here for lunch, the man must have had a pretty big lunch, because 50 cents would be the regular price of a meal?

A. I suppose he had a regular meal there if he has charged 50 cents.

Q. I would hardly think it is right for us to pay a man's life insurance and everything else?

A. I think we allowed him \$45 a month and he had to account for that, if he did not spend that the balance would be returned; that is the way we do in matters of that kind.

Q. I think it would be all spent, because he had paid it out at the rate of 50 cents for a lunch, and then here is 50 cents for a porter, and sleeping car between Carleton Junction and White River, \$1.50. Everybody knows what the rate is for that; and then dinner and room at White River \$1.50, and sleeper to Ottawa \$4.50, accident insurance four days \$1; then on May 9, breakfast 50 cents, lunch at Three Rivers 50 cents, dinner \$1, lunch 25 cents, that is one day?

A. Where are these figures taken from, is it from the Auditor General's report?

Q. Yes.

A. Of last year?

Q. Of last year.

A. I expect Prince Hilkoﬀ will be here.

The department has concluded, therefore, that it must look to the United States and the continent of Europe for farmers to occupy her lands and that Canada should make the best possible selection, and it ought here to be said that in the United States the undesirable foreign element—the vicious and criminal classes—are not among the agricultural communities but among those who only go to live in the larger cities. Canada need not have a fear of such a class emigrating to her shores. We have no large cities attractive to this element.

While we can stop undesirable classes from occupying our lands we must not forget that we are not able to make our choice from those who are moving or contemplating a change to better their condition and only amongst such classes in any country can the government direct its efforts.

If the settler is one who has been engaged in agricultural pursuits in the old land, is possessed of his full faculties, steady, honest, sober and willing to work, whether he be rich or poor, Galician, Australian, Russian, Swede, Belgian or French, we believe it most desirable to encourage him to occupy our land and break up our soil and assist in developing the resources of the country, and in this way enrich himself and Canada.

If we want farmers we must go to countries where the highest proportion of the population is of that class, and where they are ready to move.

The following will give an idea of European countries in this respect:—

	Total Population.	Total Agricultural Population.
England and Wales.....	30,000,000	1,070,000
Germany.....	50,000,000	21,000,000
Sweden.....	4,300,000	1,000,000
Russia (including Finland, Poland and the Caucasus).....	108,000,000	48,000,000
France.....	38,000,000	18,000,000
Belgium.....	6,200,000	3,000,000
Austria and Hungary.....	43,000,000	24,000,000

The best opportunity, therefore, offers, under the existing legal enactment and regulations regarding emigration of the various countries for work likely to result in securing a fair number of these who are leaving their old homes in Austria and Hungary and Russia. Emigration is very greatly discouraged and in most cases forbidden in both countries, although Austria will, if its subjects are known to succeed in new countries, as has been said, permit a limited number to move as they have already done in the past.

The only restriction, therefore, that the department has placed on the individual settler, (European) is that he be possessed of not less than \$100 in cash, besides his transportation to Canada, and that he has followed agriculture as an occupation in the past. This is the arrangement under which we pay bonuses now in Europe.

*By Mr. Sproule :*

Q. That would not apply to Doukhobors or Galicians ?

A. This is a new arrangement only recently made.

We had done away with the agent bonus system, that is giving bonuses to steamship agents. We found that they practically did little or no work; that if a man wanted to come to Canada they sold the ticket to him but they put forward no effort to induce him to come. We have since then made an arrangement with the Trans-Atlantic Steamship Company who undertake the work generally. We have hopes that even in Germany they will be able to do some work which the Government cannot do. By this arrangement we give a bonus to them on settlers coming from certain countries, the conditions being that a man is an agriculturist and possessed of \$100 in addition to his transportation.

*By Mr. Wilson :*

Q. If a person chooses to come himself I suppose you cannot make that restriction ?

A. We only put on restrictions where we pay the bonus.

*By Mr. Sproule :*

Q. You still pay the bonus in the United States. This does not apply there ?

A. No.

Q. You have there the same system as before ?

A. Yes, and the same in England.

*By Mr. Campbell :*

Q. What success have you had in France. I did not hear you speak of that ?

A. Very little success. Last year I think we must have got 200 people all told from France. Our agent there is Mr. Bodard. We have only the one agent there.

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Mr. PEDLEY.—There are 413 from France and Belgium. They are classed together.

Mr. SMART.—We have two agents there and we got 200 people from France and 200 from Belgium.

*By Mr. Campbell :*

Q. These are good settlers are they not ?

A. Oh, yes. The Belgians are very good indeed. And, as I pointed out, a good proportion of the population are agriculturists there.

I forgot to mention in connection with these countries, and I may as well speak of it now, that we are pushing forward the work in Iceland this year and have sent a man to bring out a party. He reported to me the other day that he expected to bring with him about 700 from Iceland. I may say in connection with this too that it is very gratifying indeed that the Icelandic settlers in Manitoba have taken up the work of immigration themselves, and they have sent already \$6,000 to friends in Iceland for prepaying the passages of Icelandic settlers. The same thing applies to the Galicians. They have sent a considerable amount of money to bring out friends. It applies also to the German Baptists referred to. They have also sent through the Department and the High Commissioner in the last two months a considerable sum of money to friends to help them move to the North-West.

*By Mr. Sproule :*

Q. You have given the population of these different countries and the percentage that belong to the agricultural class. Have you any knowledge of the percentage of immigrants you have got that belonged to other classes, say to the Doukhobors and Galicians ?

A. The Galicians are practically all farmers of all small localities.

Q. How is it then that so many congregate around Winnipeg ?

A. There are not many there when you take it into account that there are 16,500 of them and a Galician population of possibly 18,000 in the West. There are not many in Winnipeg.

Q. I notice the police reports show a good many committals ?

A. They come in from outside. There are a good many Galicians settled within a short distance of Winnipeg but they are practically all on farms.

*By Mr. Calvert :*

Q. Can they purchase liquor near where they live ?

A. I think not, only in the villages and towns.

Q. And they buy it when they come to Winnipeg ?

A. I suppose so, yes.

*By Mr. Cochrane :*

Q. Do the Doukhobors and Galicians have large families ?

A. I think so, yes.

*By Mr. Wilson :*

Q. You did not say what the bonus is for Galicians and Doukhobors.

A. Five dollars a head.

Q. For men and women both, no difference ?

A. Yes.

*By Mr. Sproule :*

Q. I had a statement from a party in the locality where the Doukhobors are that where they have settled the land has gone down in value, as Canadians do not like to settle there but sell out and leave. Do you know anything of that ?



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A. There may be cases of that kind, but if so they are very few. A couple of years ago I heard a good deal of opposition, but since then I have heard the opposite. I have heard that these people make such good neighbours, helping themselves and those about them, that the neighbours are glad to live among them.

Q. It is only within the last few months that I have had these letters.

A. It may be so, I won't say.

Q. Some people think it would be remedied by not settling them in colonies?

A. Well, they are not all in colonies. Any colonies of Galicians are small, except at Edmonton where they originally went in.

Q. I think these are the Doukhobors that these letters refer to.

A. Well, they are in colonies of probably 2,000 each. Of course we have given strict instructions in regard to the matter of a bonus and the arrangement with this steamship corporation, that they are not to encourage in any way the emigration of any but the class we have named, and so far as we know they are adhering to that.

Q. Suppose that the steamship companies bring in a lot of immigrants, how do you determine that they have complied with your requirements as to the class they belong to?

A. Well, we could very quickly tell whether a man is a farmer or not. If it should prove that he is not a farmer we simply charge it to the company.

*By Mr. Calvert :*

Q. Provided a man comes of his own accord, and takes passage by the steamer is there not a danger that they should class him as one of their number? And how can you tell what money he has?

A. Well, there is a possibility they might. As to the question of money, that is a very difficult thing to determine. In many cases a man does not like to say how much he has. However, Mr. Pedley will know and will no doubt speak of this when he is heard.

*By Mr. Cochrane :*

Q. Would this rule apply: Suppose a party interested in the emigration of say 1,000 of these people and who puts up \$1,000—for instance an agent,—so long as they have \$100 each would that cover it?

A. Yes. As I pointed out it seems to me that possibly it might be well, as Mr. Pedley is going to discuss the work generally, to give certain statements as to the work of the past year, the administration of the branch, and the results attained, and as it might take a little longer than the committee would like to sit to-day, that if it could be arranged I would be very glad at another meeting to consider this subject. I would have Mr. Preston, who is now fully posted on all the work in the Old Country and on the Continent, and Mr. White, who is the general agent in the United States, appear before the committee and give any particulars the committee might desire.

Q. It struck me in regard to that question of \$100, where the governments are not very anxious to part with their inhabitants, would that restriction militate against their coming?

A. No.

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Having read over the preceding transcript of my evidence I find it correct.

JAS. A. SMART,

*Deputy Minister of the Interior.*

## THE EXECUTIVE OF IMMIGRATION.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, April 25, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr. McMillan, Chairman, presiding.

The CHAIRMAN—We have Mr. Frank Pedley, the Superintendent of Immigration and Colonization, and Mr. W. T. R. Preston, Inspector of European agencies, here to give us statements of their work.

Mr. PEDLEY, called, made the following statement :—

## THE OPERATIVE ORGANIZATION OF 1899.

Mr. CHAIRMAN AND GENTLEMEN,—For the convenience of the committee I propose to consider the operations of the immigration branch for 1899 under three heads, viz. : the work that is done in Canada, that which is done in the United States, and that done in Great Britain and Europe. The committee will understand that these divisions are purely artificial, although in the public accounts, the Auditor General's report, and in the discussion which has taken place in Parliament, this division has been more or less observed. The inspector of European agencies, Mr. Preston, is here, who has been for over a year in connection with the old country work, and when he is before the committee he will deal more in detail with that work than I propose this morning. The whole work of immigration is handled of course directly and indirectly from the head office. Here we have a staff of about twenty members who conduct the general correspondence, and are held daily in touch with each of the agencies throughout the Dominion of Canada, those in the United States and in Europe. The general correspondence of the branch is transacted here; the local correspondence, as between the different agents in the different countries, of course is handled there. Now, we started out this year with a very large amount of work. As was told you the other day by the Deputy Minister of the Interior, and as was intimated in last year's report, the year opened up with the coming to this country of 7,400 Doukhobors.

*By Mr. Sproule :*

Q. Permit me to interject a question as to your position—are you Superintendent or Commissioner of Immigration ?

A. Superintendent and General Inspector.

*By Mr. Featherston :*

Q. The coming of these Doukhobors made this heavy work ?

A. Primarily the work was commenced in the fall of 1898, but the first batch of Doukhobors landed at Halifax early in 1899, so that the work as far as our branch is concerned refers particularly to 1899.

*By Mr. La Rivière :*

Q. While touching that I would like to know if those Doukhobors who are emigrating from Manitoba to the States belong to that batch or to those which had come before ?

A. Well, there were no Doukhobors that we know of in this country before.

Q. Before that ?

A. Before the first boat load arrived at Halifax.

Q. You mean to say last year ?

A. I mean 1899.

Q. I thought you referred to the present year ?

A. No, I am discussing now the operations of 1899. The first load of Doukhobors arrived here in January, 1899. Those who have been threatening or deliberating moving away from Canada are part and parcel of those who came out with the Doukhobors. Whether they are Doukhobors or not is not yet determined. It has been ascertained that their moving is the result of agitation carried on by two or three men who came with them.

*By Mr. Featherston :*

Q. They did not go, did they ?

A. They went as far as Emerson and owing to the intervention, I think of United States officials, as to a violation of the alien labour law they remained at the boundary and at latest reports there were 18 or 19 of them waiting there.

*By Mr. LaRivière :*

Q. The latest report is that they have crossed and that the authorities yielded.

A. Of that we have no knowledge.

*By Mr. Sproule :*

Q. I saw the statement made in the papers that they were bound to go.

A. Well, the newspapers have reports very confusing and perhaps not so closely sticking to the facts as those from our agents.

*By Mr. Clancy :*

Q. So the only information in the Department is that they are now at the boundary and that the agents of the United States will not let them go in ?

A. And they had not returned to their settlements.

*By Mr. Sproule :*

Q. For what purpose are they waiting there ?

A. I think perhaps the gentlemen who induced them to leave are conducting negotiations to see if the provisions of the United States alien labour law—or perhaps there may be some other laws which affect them—will be waived and these persons will be taken across.

Q. At whose instance did the inspector at Emerson stop them ?

A. Correspondence took place almost conjointly with the head office here and with our commissioner at Winnipeg.—

Q. Correspondence took place with the alien labour law agent at Emerson ?

A. And I think our commissioner of immigration had some correspondence with the United States representative at Emerson who communicated with Mr. Powderly, Commissioner of immigration at Washington.

Q. To what regard ?

A. Calling his notice to the fact that some persons were endeavouring to take away from this country certain Canadian settlers under a contract, and, while I have not the correspondence before me, just intimating whether in his opinion that was not a contravention of the alien labor law.

*By Mr. Clancy :*

Q. How many started ?

A. About 30, but there are only 18 or 19 waiting at the boundary.



## APPENDIX No. 1

*By Mr. Larivière:*

Q. So it was calling their attention and asking them to enforce the alien labor law about which we complain so much?

A. Without the correspondence I cannot say; that may be a proper inference.

*By Mr. Clancy:*

Q. What other inference is there to be drawn from it than you have stated a moment ago?

A. Well, I do not know; I am drawing no inference at all from it; I am only stating what information we have as to what was done towards preventing these people from leaving the country.

Q. And the steps taken by the commissioner at Winnipeg was to notify the authorities at Washington that certain settlers were leaving Canada and asking to have them stopped under the alien labour law.

A. No, my understanding of the correspondence between the commissioners at Winnipeg and at Washington is that the commissioner of immigration communicated with the United States representative at Emerson who notified Mr. Powderly that some American representatives had come to the Doukhober settlers and had engaged certain Doukhobors under contract, and called his attention to it, but whether he asked him to interfere I do not know, I think he would hardly do that.

*By Mr. Sproule:*

Q. Why would he call attention to it otherwise?

A. There is no doubt in my mind it was his intention to draw attention to it to prevent these people leaving the country.

Besides the work at the head office that done in Canada is also transacted through the commissioner at Winnipeg, with a comparatively large staff of officers, and the agents and settlers. They look after the settlers when they arrive in Winnipeg and attend to their settlement in Manitoba and the North-West.

Q. Could you give us the number of the staff there?

A. Well, in this statement which I have here which includes the clerks in Mr. McCreary's office, land guides and agents, there are about 20 outside of the immigration office proper who might be called on the regular service. Then in Mr. McCreary's office he has about ten or twelve employees, consisting of an accountant; registrar, clerks, stenographers, interpreters, caretaker, charwoman, etc.

Q. Ten or twelve inside, you say?

A. Yes. Sometimes he has to put on extra clerks when there is a rush.

Q. Where would we get the information as to who these people are?

A. I can give you the information right here or you can get it in the Auditor General's report.

*By Mr. Wilson:*

Q. Won't it be in your report?

A. No, the only names we give in the annual reports are those of the agents who report.

Q. Will it give the names?

A. No, there are a lot of officers in Mr. McCreary's office not mentioned in the report.

Q. What position do they occupy with reference to the Civil Service, are they Civil Servants?

A. No, there are very few members of the immigration staff who are; some of those at the head office are, but the others are paid out of the immigration appropriation.

## SALARIES.

*By Mr. Clancy :*

Q. Give it in detail, please. We do not get it in the report you say ?

A. The members of the staff who are inside are.

Q. Is this inside or outside ?

A. I will indicate them as we go along. Alex. Norquay, land guide, who works in the office part of the time and in the summer time works outside.

William Braun, Brandon, caretaker of the hall at Brandon, and general land guide as well. We use him also for special trips where there are an extra number of trains that have to be manned by our officials through a part of the year.

C. W. Speers, general colonization agent, whose duties are to inspect the colonies and to look after the reception, in a general sense, and settlement of the immigrants as they reach Manitoba and the North-west.

*By Mr. Sproule :*

Q. Where is he from ?

A. His headquarters are at Winnipeg, but he reports directly to the department and works in conjunction with Mr. McCreary.

Q. Will you give us the salaries please, as you go along ?

A. Mr. Norquay's salary is \$800; William Braun \$100 per month.

*By Mr. Wilson :*

Q. Is he employed all the year round ?

A. Yes, he has been on the staff ever since my connection with the department some two years and a half. C. W. Speers, \$2,000.

C. W. Sutter, stationed at Edmonton, who has charge of the work along the Edmonton and Calgary line from, say, Red Deer north, and has to do with the settlers and immigrants in and around Edmonton covering a large area around that place. His salary is \$100 per month.

Hugh Fulton, land guide at Dauphin, \$50 per month.

*By Mr. Sproule :*

Q. Where is Fulton from ?

A. From Dauphin, which the members of the Committee well know is about a couple of hundred miles north of Winnipeg on the Canadian Northern.

## DUTIES OF LAND AND GUIDES AND OTHER EMPLOYEES.

*By Mr. Clancy :*

Q. It will be well to explain the duties of the land guides—you have several of them there ?

A. The duties of the land guide are, in the first place we try to select a man, as far as we can, conversant with the locality in which he works, who knows the townships, the sections, and the quarter sections in his district and who is well acquainted with the available homesteads. That man takes a party of immigrants at the point of landing wherever that may be, he meets them where possible, some of them of course come in by rail and others drive in. If they come in by rail, he generally takes a team and drives them through the section of country, probably ten or fifteen miles from the point of starting, shows them the land and designates the quarter sections that are available for homesteads. Some of them are not easy to please and he may have to take them over an area of ten, twenty, or even forty miles, and is sometimes engaged two or three days in this way before the land seekers are satisfied. That is his duty, he shows the land and puts them on sections that are available.

## APPENDIX No. 1

*By Mr. Wilson :*

Q. He takes a party out at a time, I suppose ?

A. Where there is a party he takes a party, but occasionally a man comes out who is a delegate and represents a large number.

*By Mr. Sproule :*

Q. Are these men employed in any other capacity except in immigration work ?

A. By this department.

Q. By this or any other department ?

A. I am not prepared to say that exactly, The land guides that we have that are employed at a salary are not employed in any other capacity that I am aware of.

Q. This salary per month, does it apply to them ?

A. If he is paid a salary by the month, it does, I presume. I have no knowledge to the contrary as far as I know, his whole services are given to the Department, but we have a system of paying men by the trip, some men are paid that way.

*By Mr. Wilson :*

Q. What does a land guide do in the winter ?

A. Some of these men are employed all the year round, people have been coming in all the year ; if there is any cessation, probably it is only for a couple of months in the winter, and then there is a good deal to be done in visiting people they have settled and in visiting the sections open to prospective settlers.

Q. But he cannot visit the land that is to be opened out in the winter to tell very much about it ?

A. In some parts that particular branch of the work cannot be carried on, but the people are coming in all the year round and they have to be looked after, either in the immigrants' hall, or in assisting them to get settled as well as possible.

*By Mr. Clancy :*

Q. Have you a record of the work done as they go along to distinguish between the work done in the winter and that done in the summer months, that would be information to the committee ?

A. We have a system of reporting from a great many of our agents in which they show the work day by day.

*By Mr. Douglas :*

Q. Is it not a fact that many of these land guides are paid by the trip, by mileage, and are not employed by the month ?

A. Yes. Some are paid by the trip.

*By Mr. Wilson :*

Q. Those you have given us are salaried men by the year ?

A. For instance take Mr. Sutter at Edmonton, who is a fair sample, he is immigration agent and also acts as land guide. We have a large building on the north side of the river at Edmonton, which we rented last year, and we also have a building on the south side, Strathcona, that building is more or less used by settlers the year round. To the north-east of Edmonton there is a very large Galician settlement and to the east of it again towards Fort Saskatchewan there are large numbers of settlers, and it is almost impossible to find immigrant halls anywhere in the west that are not occupied to a greater or less extent every month in the year.

Q. Do parties who go out and settle on the land come back and use these halls to stop in ?



A. They may come out in the fall of the year and only get started on their location, and the women and children may come back and occupy the immigrant hall for a week, two weeks or a month until the house is in a fit state for habitation.

*By Mr. Clancy :*

Q. Does Mr. Sutter have any other man there to assist him ?

A. We had Wagner at Edmonton, who is employed as occasion requires, we probably give him four, six or eight months' employment in the summer months.

Q. To do the work in connection with these persons residing in the halls temporarily ?

A. No; we employ him where parties have to be driven out to locate themselves on the land.

*By Mr. Sproule :*

Q. How do you pay Wagner ?

A. I think he is paid \$40 or \$60 per month.

*By Mr. Wilson :*

Q. Would it not be better to give us the permanent officials first and the temporary ones afterwards ?

A. I have the list here from the accountant and the committee may find the arrangement different from their own, but the facts are all here. We have Hugh Harley and Paul Wood also at Dauphin, at \$50 a month; Harley is classified here as being at Dauphin, but properly speaking his operations are carried on at Swan River.

Q. Are they annual ?

A. Yes. These are at \$50 a month. We have a hall at Dauphin——

Q. Could you furnish us with a list of these after the meeting is over ?

A. Yes, I can furnish the list or read it over as I go on.

*By Mr. Sproule :*

Q. Better read it over and give us an inkling of what they are doing. In these quotations does that mean \$50 or \$100 and expenses ?

A. Yes.

*By Mr. McGregor :*

Q. Expenses when out ?

A. Oh, yes, it does not mean when they are at home. If it is the desire of the Committee that I take these officers up as I go on, I will do so.

*By Mr. Sproule :*

Q. I think it would be better because it gives us an idea where they are located and what they are doing.

A. We had Paul Wood at Dauphin; he has been employed by the Department for some years during busy months. Then at the Dauphin shed—we also have John Robertson; he is employed temporarily from time to time when the rush of business demands it.

Q. What do you pay him ?

A. \$50 a month.

*By Mr. Clancy :*

Q. You say 'and expenses,' is that living expenses ?

A. When a man is travelling on departmental business from his home his expense are allowed by the department.

## APPENDIX No. 1

*By Mr. Wilson :*

Q. These men are not regularly appointed by the year ?

A. No, these men are monthly and as a matter of fact are not employed the whole year round.

## IMMIGRANT OCEAN TRAVEL.

*By Mr. Clancy :*

Q. Perhaps you can give us the months they are employed ? The reason I ask is that it has something to do with those permanently employed.

A. The busy season in Manitoba and the North-West commences about the month of April, or perhaps in the end of the month of March, and ends about August or September. The ocean travel is heaviest generally in the month before navigation opens at Quebec and the month after it opens. The first spring passengers come to Halifax and the first Quebec boat came in yesterday with about 250 passengers for the North West, the *Vancouver*, and from this on to the close of navigation the ocean passengers will land at Quebec. These are the busy months in which we have to have extra help.

*By Mr. Wilson :*

Q. Why are they not brought to Montreal ?

A. The Immigration Act especially provides that all steerage passengers must be landed at Quebec.

Q. For what purpose ?

A. For quarantine ; at Grosse Isle, 27 miles below Quebec, we have a splendid quarantine station there.

*By Mr. Clancy :*

Q. What class of persons are those who are just landing now—where are they from, and what is supposed to be their occupation generally ?

A. The occupation of the steerage passengers and the ones upon whom we exercise any care at all, must be satisfactory to the Department as of the agricultural class. That is the only class we deal with or keep a record of as immigrants. We do not classify the first-class passengers or artisans as immigrants. We only keep a record of such of the passengers as are agriculturists.

*By Mr. Rogers :*

Q. Whether farmers or labourers ?

A. Whether farmers or farm labourers, we classify them.

## BONUS REGULATIONS.

*By Mr. Clancy :*

Q. Where artisans are brought in do you reject them or let them take care of themselves ?

A. Well, I cannot answer that question by yes or no. If a mechanic comes to the country and goes to the North West with the intention of settling there and places himself in communication with the Commissioner of Immigration, we will do all we can to help him along.

Q. The same as an agriculturist ?

A. Yes, but we would not pay a bonus.

*By Mr. Sproule :*

Q. If he settled on the land would you ?

A. Yes, but if he is an artisan he does not come within that provision.

*By Mr. Macdonald (Huron) :*

Q. That is about £1 ?

A. £1 for every adult over eighteen coming from the continent, and it has been modified so that under the present arrangement it would be 17s. 6d. under 10,000 and £1 over 10,000.

*By Mr. Clancy :*

Q. Has there been any modification as to the age ?

A. As the bonus now stands it is paid on all those over twelve. Under the old bonus we had a sort of a double system ; from the continent it was over eighteen years of age, and from the United Kingdom it was over twelve—from twelve it would be \$1.75, and from five to twelve 87½ cents—but under the present system the bonus is applicable to all those from the continent over twelve years of age.

Q. That is from Europe as well ?

A. Yes, the bonus is paid on all immigrants to Canada, male or female, destined for Manitoba and the North-west, and who are twelve years of age and over. Twelve is the majority limit fixed by the steamship companies ; a child who is over twelve—fixed by the steamship companies as a sort of artificial limitation—is an adult.

Q. Do I understand that formerly the rule was all persons over twelve years of age coming from any part of Great Britain were admitted and the companies were paid the bonus, but persons coming from the continent of Europe were under a different rule and had to exceed eighteen years of age ?

A. Yes.

Q. I understand the presumption to be that one was a more desirable class of immigration than the other, and therefore the distinction ?

A. No, I think not. The reason set forth by Mr. Pope who at that time was Minister of Agriculture was to the effect that this result was arrived at after much correspondence between the High Commissioner and Mr. Pope, as Minister of Agriculture. They had considerable correspondences over what steps should be taken to induce continental immigration. Continental immigration was all going to the United States. The Canadians were not getting their share of a desirable foreign element, and, as a result of this correspondence and of very full investigation of the question, this course was decided on, and an Order in Council was passed to that effect.

Q. When ?

A. In 1882, fixing the bonus at £1 for each adult over eighteen years of age.

Q. When was the change made from eighteen years to twelve years for continental immigration ?

A. It was changed within about a year, within the last year. The system of bonusing has been modified during the last two or three years, in fact it was suspended for a time in regard to Galicians and Doukhobors.

*By Mr. Wilson :*

Q. Is the bonus the same to all persons of twelve years of age and up ?

A. Yes.

*By Mr. McLaren :*

Q. This last boat load of immigrants which has come to Quebec were they continental ?

A. At Quebec there were about 262. They are pretty well distributed, 60 or 70 Russians, 30 Germans, 41 Finlanders, 16 or 17 Scandinavians, and the balance from the United Kingdom. I just got the telegram last night, but it is fixed on my memory because I had some telegraphing to do arranging to have the trains manned and I remarked when I read the communication from the agent that that was a pretty generally distributed crowd, not all from one place.



## APPENDIX No. †

*By Mr. Gillies :*

Q. Do you give bonuses to agricultural labourers who have not the means to settle?

A. The question as to whether they have means to settle has never been a factor in determining the payment of the bonus. The bonus is paid to all comers within the agricultural class, whether poor or rich.

Some hon. members : Hear, hear.

*By Mr. McGregor :*

Q. You pay the bonus after the man is settled do you not?

A. On his arrival at Winnipeg. The Commissioner of Immigration has to check the list and be satisfied he comes within the bonused class.

*By Mr. Sproule :*

Q. How do you know he will not leave the country the next day?

A. This question of tying the Department down with fixed rules as to when the bonus shall be paid, has been before the department for many years. At one time there was a condition that he should be actually on the land so long and satisfy the immigration commissioner and that provision was made so as to prevent a man coming in reporting at Winnipeg and then slipping over to the other side so that the bonus and the man were lost.

*By Mr. Guillet :*

Q. Don't you pay a bonus on those coming to Ontario and the other provinces?

A. Only on those coming to the North-west.

Q. Are you making any effort to bring immigration to Ontario?

A. Our efforts are put forth in a general sense to bring immigrants to Canada. The only discrimination, if it can be called so, is that the bonus is payable on those who settle in Manitoba and the North-West Territories.

Q. Have you any information in regard to the need of farm labourers, of additional farm labourers in Ontario?

A. No.

Q. Are there not many representations made to the Department on that subject?

A. No, very few. The strongest representations that are made are for domestic servants, but the farm labourer so far as representations are made to us is not much in demand.

*By Mr. Macdonald (Huron) :*

Q. Is there a rule of the Department that the immigrant must be worth \$100 over and above transportation?

A. Yes, sir. It is but fair to state to the committee, however, that under the present bonus arrangement the head of the family shall be possessed of at least \$100 or where there is a community of families working together, it shall average an amount sufficient not to become a public burden; so we have endeavoured in the arrangements to avoid the department being called upon to contribute very largely to persons in destitution.

*By Mr. Wilson :*

Q. But you will hardly insist upon them showing up?

A. We make a pretty thorough examination of all who come in and upon whom we are liable to pay the bonus.

*By Mr. Clancy :*

Q. Since it has been the policy of the Department to bring agriculturists to that country I would like to ask what evidence the Department has in determining

whether these persons before they came to this country were engaged in agriculture or whether a large share of them come here to enter upon agriculture for the first time, in Canada. What evidence has the department to guide it in deciding the class of immigrants on whom to pay the bonus and to encourage. I am speaking now more particularly of the immigration from continental Europe?

A. The evidence we have is derived from the written communications that take place between our agents and those inquirers for information, by personal visits of our agents to the districts from which an immigration movement is likely to take place.

Q. That is in Europe?

A. Yes.

Q. Agents in Europe I understand are paid so much in connection with the steamship companies on all they send here?

A. Our own agents are paid a salary.

*By Mr. Sproule :*

Q. The steamship companies, are they not paid?

A. Their agents of course are paid the bonus. We do not pay it to our agents, we do not pay it to the immigration agents but to the steamship companies. That information obtained at the point of starting is supplemented by information obtained at the point of destination. Those immigrants arriving in Manitoba and the North West are subjected to an examination by our officials there. They are followed there, kept track of, until in the opinion of the department the bonus is earned.

#### CONTINENTAL IMMIGRANTS AND AGENCIES.

*By Mr. Clancy :*

Q. Where are your agents located?

A. We have a paid agent in Liverpool, or do you mean on the Continent?

Q. Yes, on the Continent.

A. We have a paid agent in Belgium, we have two paid agents in France, we cannot have paid agents in the other countries, they have to work.

*By Mr. Wilson :*

Q. On the side?

A. It may be. We have an Austrian gentleman who was doing some work for the Department for several years and was largely instrumental in promoting the Galician movement, but at present in those countries where emigration work is prohibited, except under certain restrictions we have to work through the steamship companies and in an indirect way.

Q. How about the Galicians and Doukhobors?

A. The Galicians came to this country as the result of a movement started in 1895. I was looking over the record some time ago and I find that an Austrian representative came to this country after consultation with the then High Commissioner and placed himself in communication with the then Minister of the Interior.

The matter appeared to impress the department very favourably and as a result in the spring of 1896 about 127 Galicians came out, if I remember correctly, as a result of correspondence, making this detachment a preliminary to a still larger movement. The Austrian gentleman referred to continued working for the department a couple of years, and as a result partly of his labours and partly of the work of the department in a general sense, the bulk of the Galicians have come out during the last two or three years.

Q. Was he paid a salary?

A. He was paid an expense allowance and so much for his services which were valued by the Department.

## APPENDIX No. 1

Q. Under his work a number of Galicians came out here. What means had the department of tracing the former occupation of these men whether they were agriculturists or not ?

A. In the first place he would only be paid by the Department upon his sending out agricultural immigrants.

Q. And they had to depend upon his statement ?

A. To a certain extent. The correctness of his statement, as far as that is concerned, has been verified by the large settlement of Galicians in the North West where 95 or 99 per cent of the Galicians that have come to the country are settled and are engaged in working their own land.

As far as the Doukhobors are concerned, that is, from a departmental standpoint, an impromptu movement, we were unaware of it until apprised of the fact that such was likely to take place through correspondence from the High Commissioner, and one or two other sources, and by a visit of four representatives who came to this country in September of 1898 and who discussed the matter with the Department and indicated their intention of visiting the North-west. They said that if satisfied with the country and if they found good land there, that within three or four months they thought the community, which was composed of some 7,000, would move. They visited the country, they were satisfied with it, and as a result 7,400 Doukhobors were landed here, the first coming in about the middle of January and the last about the first of July.

*By Mr. Sproule :*

Q. That was in 1898 ?

A. No, that was in 1899. The Government was under comparatively little expense in bringing the Doukhobors. The only expense we incurred was that incurred in attending or showing Prince Hillkof and the delegates through the country, and it did not take very long for them to make the selection, and the increase of the immigration expenditure which had to be made in order to move in a very short time such a large number of people ; each boat-load required about six trains to convey them from the seaboard to Winnipeg and as the first two boat-loads came in during the middle of the winter, when it was practically impossible for them to go out upon the land, we had to make a little extra provision towards housing them for a month or six weeks, or perhaps two months for the first lot that came.

*By Mr. Wilson :*

Q. Where did you house them ?

A. In the first place, the Department in order to accommodate such large number made arrangements to rent the round house of the Canadian Pacific Railway at East Selkirk, which after being fitted was capable of accommodating about 1,000 to 2,000 people. We also used the immigration hall at Winnipeg and an extra building which we obtained, the immigration hall at Brandon, the immigration hall at Portage la Prairie and the immigration hall at Dauphin, so that we accommodated the whole of the Doukhobors in practically our own buildings.

Q. Much expense about it ?

A. It is pretty hard for me to tell what the expense was as distinguished from what the expenditure would have been had they not come. It is a part of our regular immigration expenditure, and any moneys that we have advanced to them beyond the ordinary immigration expenditure have been recompensed by the Doukhobors.

Q. You could make a reasonable guess ?

A. Well, if the expense of feeding the Doukhobors while they were en route from Halifax to Winnipeg be any indication, then the expense would be very small. I think we moved them up to Winnipeg for an expenditure of about 50 cents a piece, that is for feeding them.



Q. That is as far as feeding only is concerned ?

A. Yes.

Q. That is pretty light feeding ?

A. Well, all the food they asked for was bought, but it was bought in large quantities and put on the provision train and we sent them through, they had lots to eat and when they got to Winnipeg they were perfectly satisfied.

*By Mr. Campbell :*

Q. What kind of food did they require ?

A. Bread, sugar, cheese, milk and tea, no beer and no meat ; they are not meat eaters.

*By Mr. Sproule :*

Q. They are vegetarians then ?

*By Mr. Macdonald (Huron) :*

Q. Another point I wish you to bring out is in regard to the bonus not being paid to the steamship agents in the case of the Doukhobors ?

A. Yes. One of the conditions of the bonus arrangement with the Doukhobor committee was that the money usually paid as a bonus to the steamship agents should go to the settlement of the Doukhobors, and, as Mr. Smart said here in his remarks a week ago, the money was paid to a committee at Winnipeg and expended by them entirely in the settlement of these people on the land.

*By Mr. Wilson :*

Q. Was it not a little more than is allowed to the others ?

A. A little more, it was \$5 to every man, woman and child.

*By Mr. Richardson :*

Q. Did they pay their own passage over ?

A. Yes, the Government had nothing to do whatever with the arrangements regarding their transportation. I understand that they chartered the steamships from Batoum to Canadian ports, but we know so little about it that I cannot say what they paid for the boats.

*By Mr. Guillet :*

Q. But they got the bonus ?

A. Yes, it was paid to their own committee, and I understand the Canadian Pacific Railway gave them a little lower rate from the seaboard to Winnipeg, but what that rate was I do not know ; we had nothing whatever to do with it and had no expenses so far as the transportation is concerned, this was looked after altogether outside of the department.

*By Mr. Sproule :*

Q. And this bonus, if I understand it, was \$5 per head for every man, woman and child ?

A. Yes.

*By Mr. Clancy :*

Q. Perhaps Mr. Pedley could give the cost of every immigrant coming, as to the bonus and as to the transportation, I mean the relative cost, the average per head of those coming ?

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*By Mr. Sproule :*

Q. I was going to suggest we might as well get out about the rest of these agents because we dropped off with them before we got through ?

A. The only way I can figure out the cost—do you wish me to say the cost to the immigrant to get here.

*By Mr. Clancy :*

Q. No, the cost to the country.

A. That is a pretty extensive question to go into as to what each immigrant cost. Our appropriation say is \$360,000 for the year ending 30th June. The total number of immigrants that came to this country last year is nearly 45,000, so that if you struck an average of that it would be about \$9. apiece.

Q. But there are some of these that receive no bonus, are there not ?

A. Yes. I have a list here of the nationalities of all the immigrants and I could probably tell you from that about how many received a bonus. I could only approximate that; the only way to get it exactly is to get the accountant to go over the figures.

Q. Give it to us approximately.

A. We would pay on the Doukhobors, 7,350, we would pay on 6,700 Galicians up to the time we suspended the bonus on the first of June.

Q. Some came after that ?

A. Some came after that.

*By Mr. Wilson :*

Q. Some came after ?

A. Yes.

*By Mr. Clancy :*

Q. How many ?

A. Well, that would mean I would have to make an analysis of the returns. We would pay it on the Germans, 780; we would pay it on the Scandinavians, 1,526; we would pay it on the French and Belgians, about 413; then there are 5,169 that we have classed as miscellaneous nationalities, some of them would be entitled to bonuses and some would not, because some of them would be either Galicians or kindred races, and these were excluded.

*By Mr. Wilson :*

Q. Why did you stop giving a bonus on Galicians ?

A. Well, that is a question that I do not know that I am prepared to answer. it is rather one of policy; I don't think that is departmental.

*By Mr. Clancy :*

Q. You have not quite finished the statement yet; you have given us the persons separately, but what is the aggregate of those on whom a bonus was paid and the whole number relative to those who came in ?

A. The statement would not enable me to say; I would have to dissect the statement and see who was over eighteen years of age. I could get the accountant to furnish that.

#### MISCELLANEOUS IMMIGRATION STAFF AND SALARIES.

Now, then, we had got as far as the agents at Dauphin. There is Thomas Bennett, clerk at Edmonton, at \$60 a month.

*By Mr. Sproule :*

Q. Clerk in the office ?

A. Yes, he is an old official of the Department; he has been there for years; I think he was in connection with the land office at Winnipeg.

*By Mr. Wilson :*

Q. I suppose he is permanent?

A. Yes, in the sense that he is there all the year round.

*By Mr. Sproule :*

Q. That is \$60 a month and found.

A. Well, he is only found when he travels, but he does not travel much. He is an elderly gentleman and is generally in and around Edmonton South to meet the trains, and takes a deep interest in the settlement of Strathcona. Then there is W. F. McCreary, commissioner of immigration at Winnipeg, who has a salary of \$250 a month.

*By Mr. Campbell :*

Q. When was he appointed?

A. Mr. McCreary was appointed in the March of 1897. All these figures of course appear in the Auditor General's Report for 1899 as the staff was then constituted. Then there is Dr. S. C. Corbett, medical officer, who gets \$50 a month, whose duty is to visit the Winnipeg immigrants' hall regularly and attend to all cases of sickness that arise there, while these immigrants are under our control.

*By Mr. Wilson :*

Q. He is hardly permanent then, it is not a yearly amount.

A. Well, it is a permanent office, and he is the third or fourth doctor I know who had held it. Then there is Miss K. Duff, a stenographer, at \$45 a month; Harvey, an interpreter, \$1.50 a day, a Russian; C. Genik, at \$1.50 a day, he is a Galician; Charles Hislop, clerk and caretaker, at \$800 a year, he is one of the old officials; Charles A. Jones, clerk and interpreter, he is a German interpreter, and has been on about a year and a half or two years at \$75 a month; S. Gray, clerk in the office, at \$912.50 a year—I suppose he is paid by the month, and that accounts for the broken amount; A. Moffatt, the chief accountant, at \$100 a month; Charles Mair, clerk, at \$75 a month.

*By Mr. Olancy :*

Q. Is that in the Winnipeg office?

A. Yes. W. H. Paulson, Icelandic interpreter, an agent who has made one or two trips to Iceland and has gone through the Icelandic settlements and gathered letters from his friends for use in the United States and Iceland. He gets \$100 a month. Léon Roy, French interpreter, at \$75 a month, and J. W. Wendelbo, Scandinavian interpreter, at \$800 a year.

Q. Are these all permanent?

A. Oh, yes, they are permanent in this sense that they are kept on all the year round, although the department is able at any time to dispense with their services.

*By Mr. Parmelee :*

Q. They are not in the Civil Service?

A. They do not belong to the service in the way of coming under the Civil Service Act. At Yorkton, we have Samuel Foster, the caretaker, and then we have one Bergthor Johnson, who is an interpreter there, and acts in connection with the foreign settlements, at \$50 a month.

*By Mr. Sproule :*

Q. What is Foster's salary?

Q. He has \$50 a month. There is W. L. Watt, who is a clerk in the Winnipeg office, at \$1,000.



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*By Mr. Clancy :*

Q. How many clerks have you in Winnipeg ?

A. I think the number of clerks in Winnipeg is about eleven or twelve in the office, and the outside staff that would be employed all or most of the year would be about twenty.

Q. Well, now, in the Winnipeg office could you give the committee some definite information as to the duties to be performed by this large staff ? I suppose each has some special duty ?

A. Well, the Winnipeg office, if I may use the expression, is the dumping ground for all the immigration from the east and from the south that crosses at Emerson or Gretna. Last year there were reported at Winnipeg from 30,000 to 40,000 people, excluding those who came from Eastern Canada.

Q. To whom was that report made ?

A. To Mr. McCreary. He and his officials meet every train coming from the east and south, and they are literally besieged during the busy season by applicants for information and assistance, that is assistance towards getting out on the land. It is the regular office for information and requires a large staff of interpreters and clerks to handle the immense numbers of people calling daily at his office asking for information generally and also as to specific points.

*By Mr. Clancy :*

Q. It would be well to make that clear ? I presume when you make use of the word "officers," you mean interpreters and land guides and not those in the office. Who are the officers who meet the trains and so on ?

A. First we have Mr. McCreary himself; he attends every train as far as he can. Then we have Mr. Wendelbo, the Scandinavian interpreter, Mr. Roy our French interpreter, Mr. Jones, the German interpreter and Mr. Paulson our Icelandic interpreter. These men are supposed to meet every train coming in from the east, and each man takes charge of the members of his own nationality. There is always a stop at Winnipeg, for an hour at least, and a great many of them, if they are going out on the branch lines, may have to wait in Winnipeg for a day or a couple of days. Those ticketed right through to points on the main line, as, for example, to Regina for Prince Albert, or Calgary for Edmonton, will go right through on a special if there are enough of them, or, if not, on the regular train. But to a greater or less extent each of our officers' time is taken up with the members of his own nationality on their arrival. Mr. McCreary has to keep a record of each of these, the age, place of starting, all about him, for the information of the head office, and in order to enable us to say whether the bonus is properly payable or not.

Q. From whom does he get the information ? From whom does he receive the authority upon which he proceeds to check them ?

A. The start of taking the information is made when the train leaves Halifax, St. John, Montreal, Quebec, or wherever it may be. People from New York and Boston come to Montreal and take the Canadian train west. We send an officer with every train going through. Where there is a special train he has charge of the special, and where there are a sufficient number to, say, make one or two cars but which are attached to the regular train, we send a man up as far as Fort William. We have a man from Fort William west who travels on every train, Mr. McGovern, who has been for 12 or 15 years in that work, and these men carry a full schedule which they have to fill in showing the information which the department requires in order to enable the department to deal with the immigrants from a bonus and various other standpoints, to classify them and make the records as complete as possible.

*By Mr. Guillet :*

Q. Where do you examine with regard to the bounties to find out the amount of money they have ?

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A. The only place they would be examined as to effects would be at the port of landing, to see if they come within the Customs Act or not. That is about all we try to find out by personal enquiry what money they have. Of course, money passes the customs officials without detection, and we try to find out what each trainload has in the way of money. There is a difficulty about this in that the average European is not so anxious to show his wealth as we are, and is apt to conceal the amount of money he has.

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 COMMITTEE ROOM 46,  
 HOUSE OF COMMONS,  
 WEDNESDAY, May 2, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr. McMillan, Chairman, presiding.

The CHAIRMAN.—We have Mr. Pedley, Superintendent of Immigration, before us to finish his evidence.

MR. PEDLEY.—Mr. Chairman and Gentlemen—When the Committee rose from its last sitting I was dealing with some phases of the work that were managed very largely from the head office, and in answer to some questions that were put by some members of the committee dealing with some details of the work as conducted in Canada, partly under the head office and partly under the supervision of our Commissioner of Immigration at Winnipeg. Besides the Winnipeg office, which is one of the main centres of our Canadian work—

#### SALARIED AND COMMISSION AGENTS.

*By Mr. Wilson:*

Q. Excuse me before you go on, had you got through with the salary part? You were giving us the names and amounts you were paying them.

A. I think at the time I was dealing with the officers under Mr. McCreary's direction. We have in addition to the names that I have already mentioned—and I wish to say that if, owing to the questions asked me, I missed any, when the report is made out, I will put them in.

Q. You might give us a list?

A. I have a list made out and before the meeting is over I will submit it.

*By Mr. Gould:*

Q. It would take a long time to read, it is very long?

A. Yes, there are altogether paid out of the immigration appropriation about 115 men, paid either yearly or monthly salaries.

*By Mr. Wilson:*

Q. Where are they; in this country?

A. No, that includes the Canadian, American and European agents.

*By Mr. Sproule:*

Q. About how many?

A. About 115.

Q. That are paid by—?

A. Monthly or yearly salaries.

Q. That does not include the commission agents?

A. No, we have about 256 commission agents.

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*By Mr. Wilson :*

Q. Now, will you tell us about how much you pay in bulk to these 115 agents ?

A. I have not footed it up.

Q. Well, can you give it to us approximately ?

A. The will average, I think, probably \$75 a month, maybe a little more. They would not average more than \$100 a month.

*By Mr. Burnett :*

Q. Besides expenses ?

A. Besides expenses.

*By Mr. Sproule :*

Q. And the commission agents ?

A. The commission agents reported a month ago were 256, that is those in the United States that are in that class. Occasionally if a gentleman is going over to the old country and wishes to do some immigration work while there we put him on a commission basis.

*By Mr. Clancy :*

Q. Can you tell us how many agents there are in the United States ?

A. That is where the bulk of the commission agents are. We have about ten salaried agents in the United States.

Q. Well, could you give us the aggregate sum paid the the salaried agents ?

A. Well, I can give you the salaries. M. V. McInnes, Detroit, \$125 a month ; D. L. Caven, who has been transferred from Michigan to Ohio, \$100 a month ; James Grieve, Saginaw, Michigan, \$100 per month ; J. S. Crawford, Kansas City, Missouri, \$75 a month ; Benjamin Davies, St. Paul, Minn., \$125 per month ; T. O. Currie, Steven's Point, Wisconsin, \$100 per month ; C. J. Broughton, Chicago, \$75 per month ; W. V. Bennett, Omaha, Nebraska, \$75 per month ; W. H. Rogers, Watertown, South Dakota, \$75 per month ; E. T. Holmes, who is at Indianapolis, Indiana, now, \$100 per month ; his name will appear in the Public Accounts as of St. Paul, Minn., but he has been transferred to Indianapolis during the last few months ; C. O. Swanson, who has his home at Waterville, Quebec, but who is classed as a United States agent, is getting \$125 per month. These are the salaried agents.

*By Mr. Wilson :*

Q. These are part of the 250 you refer to ?

A. No, these are salaried agents.

Q. And you have 250 besides these ?

A. We have 256 commission agents besides these ; I will give you the number in each State—I have the names and addresses here—or, if the committee wishes, I will read the whole list.

*By Mr. Moore :*

Q. Why is there a discrepancy in the salaries paid ; some men get \$75 a month, others \$100 and others \$125.

A. The salaries are fixed entirely by the Head of the Department.

*By Mr. Stenson :*

Q. Are these the only expenses ?

A. They get travelling and living expenses.



*By Mr. Martin:*

Q. Give us those?

A. The Public Accounts will show them; there is one \$125.

*By Mr. Wilson:*

Q. Travelling expenses and salary?

A. Travel and livery and other expenses.

Q. Some of them seem to get \$800.

A. Per month?

Q. No, per year.

A. Take St. Paul and Detroit for instance, they are the distributing points for the States in the way of literature and exhibits. There are a good deal of freight and express charges and postal charges in the account. St. Paul, for instance, is the distributing point for all people going to the North-west. They come over by the Great Northern Railway or the Northern Pacific Railway to Emerson or Gretna, or by the Minneapolis, St. Paul and Sault Ste. Marie Railway to North Portal, from Ohio, Kansas City, Iowa, and even from Michigan, and centre in St. Paul, where they have to be handled by our agent, and so the work of our agent there is very heavy.

Q. I notice that last year Mr. McInnes' board and lodging was something over \$800.

A. As far as my memory serves me his hotel bill is \$80 per month, maybe more. Mr. McInnes has been styled as the chief agent for the United States at Detroit.

Q. But when he is at home you don't pretend to pay his hotel expenses, when he is in the city?

A. No.

#### COMMISSION AGENTS.

Q. How many commission agents have you in each State?

A. The number of commission agents we have in the State of Michigan is 88; in the State of Minnesota, 57; in the State of Wisconsin, 26; in the State of Ohio, 28; in the State of Iowa, 11; in the State of South Dakota, 7; in the State of North Dakota, 3; in the State of Missouri, 5.

*By Mr. Cochrane:*

Q. These are all on commission, are they?

A. These are all on commission. In the State of Texas there are two agents; in the State of New York, one; in the State of Indiana, two; in the State of Idaho, one; in the State of California, two; in the State of Kansas, four; in the State of Nebraska, five; in the State of Pennsylvania, two; in the State of Wyoming, one; in the State of Illinois, four.

*By Mr. Morin:*

Q. What city in Pennsylvania have you an agent stationed at?

A. We have Mr. A. W. Alexander at Burnham, Pennsylvania, and Mr. Samuel Dunseith at Pittsburg, Pa.

*By Mr. Martin:*

Q. Has the staff not been largely increased in the past three years?

A. The staff of commission agents has, yes. I think that in the report for 1896, if I am not mistaken, the commission agents were about 61 or 67 in number, but I am only speaking from memory.

Q. Have they all been sent from Canada?

A. Oh, no; they are selected by our salaried agents. An agent goes into a village, and concluding that immigration work can be done there, he appoints a man

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who he thinks is likely to have an interest in the work of canvassing for Canada as a field for immigration and who will distribute our literature; he makes an arrangement with this man that he will be appointed to act as an agent for the Canadian Government on a commission basis.

*By Mr. Clancy :*

Q. What is the basis ?

A. It is \$3 per head for all males over 18 years of age; \$2 for females over 18 years of age, and \$1 per head for all others.

Q. All others of the family ?

A. All others under 18 years of age are \$1 per head.

*By Mr. Wilson :*

Q. You do not seem to be doing much work in New York, a big State like that ?

A. No; as a matter of fact the committee will understand that the part of the United States where we knew we were most likely to get the quickest returns for our expenditure would be in Northern Michigan, from Northern Wisconsin, Minnesota, and the Dakotas. In the State of Michigan there are a large number of ex-Canadians, also in the States of Illinois and Minnesota, and especially in North Dakota.

Q. So there are in New York ?

A. So, there are in New York; but the conditions of life with the people in Michigan and the States in the West are more nearly alike those that prevail in our Canadian North-west.

*By Mr. Featherston :*

Q. There are more agriculturists there ?

A. There are more agriculturists there, and it was thought that more work could be done with better results by putting our men in those States I have mentioned. We are not refraining from work in New York and the Eastern States, because, besides the agents that I have spoken of, we have the Lake St. John Society whose headquarters are at Roberval, Quebec, and we have the repatriation society of the city of Montreal, whose work is almost entirely confined to the Eastern States. These are under subvention from the Dominion Government for the prosecution of that work, so that while the agents who are directly under the control of the Government have been most numerous placed in the Western States, we have not thereby neglected the eastern States of New York, Vermont, Massachusetts, New Hampshire and the State of Maine.

*By Mr. Wilson :*

Q. I know the agent who inaugurated this United States business; it was Capt. Holmes, and I know he looked on New York as a very fertile field and the Eastern States as well, and that was why I wondered that you had only one agent in the State of New York ?

A. The question, so far as the matter has been discussed by the officers of the department, seems clear that it will only be a very short time before greater work may have to be done in that section.

*By Mr. Morin :*

Q. When are these agents paid ?

A. The special agent is furnished with what is called a land certificate, which he gives to the settler who presents the certificate at the International boundary and hands it to the C.P.R. ticket agent. The C.P.R. ticket agent, upon taking possession of the certificate, issues a reduced rate ticket at somewhere about one cent per mile—it varies, sometimes it is one cent and sometimes it is a cent and a

half—to the settler, to carry him from the boundary to the district in which he desires to settle. That certificate is returned to the head office of the C.P.R., at Montreal, as a voucher for the reduced rate; it is passed through their audit office and they report to the department every fortnight.

*By Mr. Sproule :*

Q. What would hinder any traveller taking out that certificate if he went to the agent and said : I am going to the North-west to live ?

A. In the first place we rely upon the agent, who is expressly told that upon none but agricultural settlers is the commission paid ; to satisfy himself that the applicant for a certificate is a bona fide agricultural settler. When the settler comes to the Canadian Pacific Railway he passes through another examination by the C.P.R official who is instructed by his company to issue no reduced rates to any one who does not come within the agricultural class.

*By Mr. Rutherford :*

Q. And a very strict examination ?

A. As far as that is concerned the scrutiny of immigrants appears to be very thorough, because we have a number of disputes coming before the department from time to time by agents asking why the commission is not paid. If there is any doubt as to whether he is a bona fide agricultural settler his name is placed on one side until it is satisfactorily established that the agent is entitled to this commission.

*By Mr. Sproule :*

Q. But he may be an agriculturist in every sense of the word, would that be any guarantee that he would settle in the country ?

A. It is a question of degree, I presume, as to what would be accepted as a guarantee that he is going there to settle.

*By Mr. Cochrane :*

Q. Would it not be better to pay the commission when the immigrant settles on his land ?

A. If you could get the agents to work on that basis, probably it might, but that system has been tried and it was done away with.

*By Mr. Morin :*

Q. I think it would be very necessary not to have so many agents in the States and to have more in Canada. After all the Canadians go over to the States, and spent their money to go there, and we spend our money to bring them back and the moment they are back away they go again. I believe we ought to have less agents over in the United States and more of them here to prevent Canadians from going and by that we would kill two birds with one stone.

A. As far as that phase of the question is concerned, I may say that last year we went very exhaustively into the question to ascertain whether there was really an exodus from this country to the States and from all the reports we could gather from the railroads we came to the conclusion, and the railroads themselves came to the same conclusion, that the movement between Canada and the United States was simply ordinary travel ; that there were just as many coming into Canada as there were going to the United States. And as a matter of fact the returns taken from the railways showing those entering and leaving Manitoba and the North-west show a difference in favour of those that came in over those that went out of between thirty and forty thousand.



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*By Mr. Clancy :*

Q. And what with regard to the province of Ontario?

A. I find that the figures show a very slight difference either way. It is just part of the regular travel.

*By Mr. Sproule :*

Q. How do you account for this fact, that in the actual returns of settlers going into the United States and coming into Canada the figures are very much the same to-day as they were several years ago and their returns and ours are about the same, about two millions, about two or three millions. How do you account for that?

A. In order to account for that fact I would have to be thoroughly conversant with the system of tabulation. I do not know whether the system of tabulation and record keeping is the same.

Q. Their system of tabulation is that a man going in enters his goods as settler's effects, as one going into the country to settle, and these are the returns that are in their trade and navigation returns just the same as ours, and we do the same. Looking over it only a short time ago I find that it is very much the same for a great many years back.

*By Mr. Morin :*

Q. Last year some 12,000 went to the United States from here and this year there must be as many gone to the United States already?

A. We went into the returns of the railways showing the number who went from Quebec into the United States and the returns show that there was no such thing as an exodus to the United States. There always is a certain movement between the two countries.

*By Mr. Wilson :*

Q. If you will take the trouble to inquire you will find that there is an exodus. The *Huntington Gleaner*, shortly after Sir Richar Cartwright's speech in Toronto' published a statement and said there was no increadse since 1896?

A. No increase in what?

Q. In the population. That the population of Quebec was not increasing?

A. Of course quite a number of the people from Quebec are going to the North-west.

Q. They say the returns come in from their municipal officers in that way and these returns show no increase?

No answer.

*By Mr. Morin :*

Q. Last year I lived on the Quebec Central and it is the most direct route from Quebec to the United States. Last year I was at Lévis and the trains were not running for two days and the waiting rooms and bar rooms and every place was full of people from below going to the United States, and a few days afterwards Mr. Casgrain spoke in the House and Sir Wilfrid Laurier denied it. But he can deny it all he likes but such is the case and it took two special trains to move them and I was on one of them, and this spring I was there again at Easter and there was six cars loaded came up from Lévis, and I said to the conductor: What is the use of six cars? Well, he says, just you look back. It is full, full of people going to the United States.

A. Of course there is nothing in the laws of this country to prevent a man going from this country to the United States. The best thing we can do, if he is going to the United States for the purpose of agriculture, is to try to convince him that the field for agriculture is better in our west than in the Eastern States.

Q. That is just what I say. You should have more agents here in Canada.

A. We make no discrimination so far as the information given by the department is concerned between an inquirer in the province of Quebec and one in the United States. Any information asked for by the people of Quebec is given just as cheerfully as to the people of the United States. It is not very much use disputing the question as to whether there is an exodus from this country to the United States but assuming there is a large moving population the question is, what are they going for. They cannot be going for purposes of agriculture. They must be going to work as manufacturers and if they go at one season of the year they come back at another.

Q. Yes?

A. So there is really little loss to the Province of Quebec. But the 12,000 we brought in from the United States last year, the majority from the Western States come as bona fide settlers and are now on the land and have become permanent settlers of Canada.

*By Mr. Sproule :*

Q. How do you know that? In the first place a number have had the commissions paid on them but what other evidence have you?

A. We have the evidence this year that there were 1,169 homesteads registered by United States citizens.

Q. How do you know that these were not Canadians?

A. We have the figures here.

Q. I only want to get at the information to see if it is reliable, because it is of importance. I am not disputing; I only want to find out how he reaches that conclusion.

A. The number of homesteads this year is something like 2,000 more than last year and the sales of the Canadian Pacific Railway and other companies owning land are much in excess of last year, 114,452 acres.

Q. Have you any means of determining from what locality they come, Quebec, Ontario or the United States?

A. Yes, the homestead report shows that.

Q. Can you give us that information?

A. If you have there the report of the Department of the Interior, if you turn up for instance, you will see that in 1899 there are 13 homesteads made by settlers from California.

Q. Where is that?

A. At page 7 of the report of the Deputy Minister of the Interior.

Q. Yes.

A. There were 13 from California, 1 from Colorado, 1 from Connecticut, 276 from Dakota, 16 from Idaho, 4 from Indiana, 27 from Illinois, 59 from Iowa, 39 from Kansas, 2 from Kentucky, 9 from Maine, 6 from Massachusetts, 126 from Michigan, 237 from Minnesota, 19 from Missouri, 25 from Montana, 106 from Nebraska, 2 from New Hampshire, 12 from New York, 18 from Ohio, 1 from Oklahoma, 19 from Oregon, 15 from Pennsylvania, 7 from Rhode Island, 3 from Texas, 60 from Utah, 1 from Vermont, 2 from Virginia, 18 from Washington, 41 from Wisconsin, 4 from Wyoming.

That gives in all 1,169 from the United States. The total number given is 6,689, I think, all told.

Q. As given by the different States here it only totals up 1,169.

A. One thousand one hundred and sixty-nine homestead entries, by people coming from the United States and the balance will be made up.—

Q. I am trying to find out how many came from the United States and took up homesteads.

No answer.

*By Mr. Olancy :*

Q. Does your report cover the fiscal year or the year ending December 31?

A. The calendar year to the end of December.

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*By Mr. Rutherford :*

Q. I would like to say, for the information of Mr. Sproule, that many who come from the States do not take up homesteads but buy land and pay good prices for it. In my own district a large number came in and bought good land and their names do not appear among the homestead lists.

A. And of course too the seven thousand Doukhobors have not yet made entry.

Q. The entries are made of heads of families and not the actual number of people, you mean the whole family?

A. One entry generally represents a number of souls. The man who makes the homestead entry gives the number of souls. We do not make any estimate of that; it is a report of the Land Office as to the number of entries and of souls.

*By Mr. Morin :*

Q. These Doukhobors who came last year, do you know how many went to the United States?

A. Thirteen.

Q. That is a very small number. Somewhere about thirty started, nineteen went half way, and the thirteen left.

*By Mr. Sproule :*

Q. Do I understand you to say you have no other way of telling how many of these people came to the country except by the homestead entries?

A. Oh yes, we have other means of determining—for instance, the number of homesteads is one of the evidences of settlement.

Q. I would take that to be of course perfectly reliable.

A. Then the land sales of the various companies is an evidence.

Q. Well, do they tell where the parties come from and who purchased?

A. They could tell where the persons came from, but in their report to the department I think they give us the aggregate amount of land sold and the amount received.

Q. They will know it?

A. Yes.

Q. But make no report?

A. Not unless it is asked for. Then we have the reports of our agents all over Canada as to the number of people who have come in and where they have located them.

*By Mr. Taylor :*

Q. What was the amount paid in commissions last year?

A. I don't think it is in the Auditor General's report.

*By Mr. Wilson :*

Q. Would it not be in the department's report?

A. No, I think not, we just report on the work, the accountant would report on the amount paid. I think the amounts are not classified here, but I will have a statement made up.

Q. Will you have it made out for the report?

A. Yes, I will have that.

*By Mr. Taylor :*

Q. That is for the year from January 1 to January 1?

A. Yes.



*By Mr. Clancy :*

Q. Mr. Pedley, in your statement a moment ago you gave the number of immigrants brought from the United States as amounting to 12,000 ?

A. About that.

Q. I see on page 141 of the report Mr. Speers states that the figure is 15,000 ?

A. I think he was of course speaking in round numbers.

Q. Well, that appears in the report and it is a wide discrepancy between 12,000 and 15,000 ?

A. Still the reports that are made by myself or the deputy minister are the reports which are correct. Some of our agents estimate the movement as greater or less than it is. I suppose Mr. Speers put that at 15,000 judging from the large number who were coming in, but we do not take it as official.

Q. But that report is official. Surely a trusted agent as Mr. Speers is should give a report completely in consonance with the report you are now giving to the committee, because if we have one report and another varying so much from it I only point out that it is misleading ; I am not going to ascribe a motive ?

A. Well, it would not mislead me because one of our agents happened to put the figures higher than we do ; we have only given such figures as we can justify from the records.

*By Mr. Taylor :*

Q. Then why do you allow his report to go to the public ?

A. Well, his report in that respect is to be taken by the public as an opinionative report, because it is altogether likely he did not go over the reports of those who came in at every boundary crossing

*By Mr. Rutherford :*

Q. Another point, Mr. Chairman, in reference to this which must be remembered is that there is a large number of immigrants who come in who never go through the immigration office at all. They come in and buy their land from the railway companies. The official statement is so, and the fact remains that they do so.

A. That is so.

*By Mr. Clancy :*

Q. The department should take notice of a gentleman making any report. We are paying out a sum of money for services and that service should be kept entirely in consonance.

A. Well, I see in Mr. Speers' report he says this : " In reviewing the year's work in immigration we consider that we have received about 50,000 immigrants, about 15,000 of whom were United States people, and it will be conceded that there has been some activity in the service."

MR. RUTHERFORD.—A large number come without any record.

MR. SPROULE—Some years ago we went over all this ground and came to the conclusion that this information was not reliable and there was no information which could be obtained from the immigration department, and then in view of this to make these statements that the exodus is stopped—I want to find the data on which this statement is made.

MR. RUTHERFORD,—After a residence of 20 years in Manitoba I can say that we may have gone over this ground but immigrants never came into Manitoba before as they are doing now.

*By Mr. Cochrane :*

Q. An agent must have a sphere of action. We have agents paid by percentage, and is there not reasonable doubt that these agents are getting paid percent-

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ages for men coming in with whom they never had anything to do; and therefore we are paying twice for getting these immigrants into Canada?

A. There is just a possibility that in some cases the work of the salaried agent may cross the border line into the territory of the commission agent, but I am satisfied this does not happen to a very large extent. For instance in the northern half of the State of Michigan, the population of which consists of a great many ex-Canadians in the towns and villages and covers a large area, our salaried agent's headquarters are at Saginaw, towards the centre and a little on the eastern side of the State. He goes say, to Sault Ste. Marie, and appoints a man there as his local agent to canvass in the immediate vicinity of that place, and the man gives that district his particular attention. The salaried agent may visit that locality two or three times a year, and besides keeps himself in touch with the local agent by correspondence. In the winter time, which is the season devoted to giving magic lantern exhibitions and lectures upon Canada as a field for settlement, he will probably be in Sault Ste. Marie two or three times, but he does not come into as close contact with persons that are going to move as does the local agent who is on commission.

Q. Are we to understand that the commission agents are not in the same district as the salaried agent?

A. They are generally scattered at some considerable distance from the headquarters of the salaried agent. It is almost impossible to prevent overlapping in some cases where the work of one agent is assisted by the work of the other, although as far as I am able to gather from going over the ground very carefully, the department is not paying very much in the way of double remuneration.

*By Mr. Sproule :*

Q. In the event of some parties going to that country to see it; and suppose they understood that the local agent was sending immigrants there at a reduced rate they might say they were going there to settle and get a ticket from the agent just for the purpose of getting reduced rates from the Canadian Pacific Railway.

A. It is hardly likely.

Q. What is to prevent these people asking the agent for a certificate, and representing that they want to go to that country so as to get reduced passage and then saying they don't like it and leave the country again, yet in that case the agent would collect his commission upon every one of these, because you say the Canadian Pacific Railway presents these agent's certificates to the government periodically and the government pays the commission on those certificates?

A. That question has been pretty much discussed by the department with the view to obviate just such a difficulty as you have presented, and we find that after having passed the scrutiny of our own agent and also of the Canadian Pacific Railway agent and further bearing in mind this additional fact that nobody is going to pay the railway fare say from the central part of Michigan to Edmonton just for the purpose of going there and coming back, we concluded that the chance of fraud is so very slight that there was no cause for alarm.

Q. But we found that in Ontario—I might mention the name Mr. W. R. Pretty, finding that people wanted to go up there to Manitoba and the North-west, inserted advertisements in the papers stating that they had parties going and inviting people to come and join the party because it would be more agreeable to go with a company of neighbours than alone, and these people would join the party in response to the advertisement and their names were handed in and the commission was asked from the government in that way. We found that that took place and it was only to see whether there is any means of avoiding a repetition of such practice that I am asking you.

A. There has been a good deal of correspondence in connection with this matter; I have gone into the subject fully and I have traced these settlers on whom the commission is asked into the place where they are located in Manitoba and the North-west.

Q. All or the majority of them ?

A. The majority of them. Where we cannot trace them we do not pay the commission. We ascertain from the regular agent at that point if such and such a man had settled there ; another method we have of locating them is to write to the postmaster and find out whether letters addressed to them are called for ; and again we ask for evidence from the agents in the States and these put themselves into communication with the friends of these people and find out where they are and whether they are corresponding with them, and we get reports from them.

Q. Where are these reports ?

A. They are on the files of the department ; we have not adopted any special system of classification for these reports. As a matter of fact they are very rare.

Q. In comparison to the whole number you read of coming in, how far have you any authentic information that settles in your own mind the fact that they have gone in and located there ? I want it to be distinctly understood that I am not trying to dispute what you are saying, but I am trying to ascertain how you reach your conclusions so that we may judge whether they are reliable or not ?

A. Outside of following a man from the time he crosses the boundary line until he takes up his homestead and stays there until he fulfils his homestead duties ; outside of adopting the passport system such as they have it in Europe, we take every precaution to see that men who come into this country and claim to be settlers are actually such.

Q. In the first place I take it, you have no means of determining whether these parties have not joined excursion parties without being led to do so from any communications on the part of your agents, and in the next place notwithstanding all that has been done they may come into the country ostensibly upon their own representations that they are going there to settle, they go there, examine the country and if not satisfied they go back again and the agent would get his commission ?

A. The excursion does not relieve the man however much reduced rate the certificates gives him after he reaches the boundary line, his excursion rate only carries him to the North-west and does not bring him back, he has to pay the full rates going back.

Q. Supposing he comes through Canada from the State of Maine he would get the reduced rate from the boundary, which may be at the boundary of the province of Quebec ?

A. He will have to buy his ticket at the boundary station between Canada and Maine, either to Winnipeg, or Edmonton and that will cost him about \$26 at one cent a mile if he is going to Edmonton ; it will cost him about \$40 or \$45 to come back, if he has to pay the full fare, it is a matter of consideration to him if he can get a reduced rate to go there in order to settle, if he is simply going there to beat the Canadian Government out of \$3 commission which they would pay the agent, it is going to cost him \$40 to make the \$3.

Q. I don't know about that. The Canadian Pacific Railway gives a reduced rate to all travellers ?

A. Admit he can come back, if he is going to leave the country, he will have to pay for it.

Q. But suppose he has an ambition to go through and see the country, I mean ?

A. Then of course we must rely upon the enquiries made by the agent and the scrutiny to which he is subjected by the Canadian Pacific Railway agents. If he is cute enough to fool both of these, the Government stands to lose some three or four dollars.

*By Mr. Sproule :*

Q. The information you give does not seem to be more reliable than this information generally is ?

No answer.

*By Mr Taylor :*

Q. The party that is working on commission will not be very critical about the scrutiny ?



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A. I think it is fair to say to the Committee that as the result of three or four years' experience in the work, there are very few people in the United States who are paying \$60 or \$75 for a pleasure trip to the North-west. As far as we can ascertain, these people are going there to better their condition and remain as permanent settlers.

*By Mr. Clancy :*

Q. I would like to ask at this stage, if the Committee will permit me, in order to keep the work of immigration in connection with the United States separate, and it would be well I suggest with the permission of the Committee to keep that separate for a moment.—I am going to ask Mr. Pedley if he can give the number of men who came here as sent here by those working on a commission, over 18 years of age, the number of women over 18 years of age and the number of persons under 18 years of age during the last calendar year.

A. Yes, I can give you this.

Q. You have that now?

A. I have not it with me but I have it in the Department.

Q. I wish you would bring it at the next meeting. I do this in order that Mr. Pedley may be able to give me the information. Another point is how much has been paid the commissioners for the whole calendar year ending December 31, last, how many of those brought in from the United States took up homesteads, and how much was paid for salaries to the salaried agents in the United States for the calendar year ending December 31 last. I do not suppose Mr. Pedley has the expenses for the calendar year. We will then have the whole cost of immigration as connected with the United States.

*By Mr. LaRivière :*

Q. I would like to ask Mr. Pedley if he has seen a copy of the last report of Mr. Powderly, the United States Immigration Commissioner?

A. I don't know that I have. The returns come to us pretty regularly from Washington.

Q. I was travelling through the State of Maine a short time ago and got hold of a paper there referring to that report of Mr. Powderly, in which he complains of the very bad class of immigrants coming into the United States through Canada?

A. I do not dispute that.

Q. What is that?

A. I do not dispute that?

Q. You do not dispute that?

A. No, because they come in from the Old Country through the Canadian ports.

Q. They come through Canada and enter the United States, and have you counted them as immigrants coming to Canada?

A. No, we make an entire distinction.

Q. You can control them?

A. The classification is made at the port of landing.

Q. Are they consigned direct to the United States?

A. They are consigned direct to the United States. They pass the inspection of United States' commissioners there at Halifax and Quebec.

Q. How is it then that they cannot prevent them entering the United States?

A. Because they fulfill the requirements of the United States law.

Q. I do not see why they should complain?

A. Mr. Powderly wants to make the law more stringent. He has been complaining for some years about the class of people coming from the Old Country through Canadian ports into the United States. These are all classified and are not included in our returns at all as Canadian immigrants.

Q. I wanted to ask if these immigrants coming for the United States through Canada were counted as immigrants for Canada?

A. No, if you have the annual report of the Department you will see that the four agencies, Halifax, St. John, Quebec and Montreal make the distinction of "cabin passengers for Canada," "cabin passengers for the United States," "steerage passengers for Canada," "steerage passengers for the United States," so that when we state that ten thousand settlers arrived in Canada, for Canada, we do not include those going to the United States at all.

*By Mr. Calvert :*

Q. The Immigration Department has no control over these?

A. No control whatever, that is if they pass the quarantine regulation at the port of landing, that is the only regulation we have. No person can land from a boat unless satisfactory to the quarantine officers.

*By Mr. LaRivière :*

Q. If he chooses to stop here you cannot prevent him?

A. No, we have no power unless he is quarantined or comes from a district proclaimed by the Governor General in Council. The Governor General has power to proclaim a certain district but that power I imagine would only be exercised in case a district was infested with cholera or smallpox or something of that kind, that would endanger the public health.

*By Mr. Clancy :*

Q. I notice on page VII to which you made reference a moment ago, that the number of persons from the United States who took up homesteads was 1,169. On the next page under the heading "Statistical statement *re* homesteads, comparing the reports of the Dominion lands agents for the calendar year 1899 with those of the calendar year 1898," making the two years, that the number from the United States is 1,064 instead of 1,169?

A. Yes.

Q. Perhaps you can account for that?

A. I cannot do that simply because I did not prepare this statement at all. This is done in the Lands Branch by the gentleman who has charge of this work, Mr. Goodeve. It is probably because of some re-entries, but it is a different statement altogether.

Q. That figure I take it would be repeated.

A. That is a system of classification of which I know nothing at all. In the report of the Deputy Minister I think you will find there are some re-entries or cancellations that affect the figures.

*By Mr. Sproule :*

Q. It makes a difference over one hundred.

A. Yes, if deducted,

Now then coming back, if that phase of the question has been settled by the Committee, to the work of the head office for the year, (and I wish to pass over this rapidly) our work shows considerable of an increase. The attachments to our files during 1899 were 29,276 as compared with 22,724 in 1898, and 15,462 in 1897. That is owing to the advertising by the Department, the distribution of literature and work of agents which has kept the correspondence at headquarters constantly increasing until now it is almost double what it was some two years ago.

The immigration agents in the United States sent us lists containing 35,463 addresses of persons asking for information, all of whom were sent pamphlets, etc. These were all responded to and the literature sent out amounted to about 219,815 pieces.

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*By Mr. Sproule :*

Q. That is to individual people ?

A. Individual people. We ask our agents to send lists of names into us and we mail them matter from the head office.

Q. Then you give your agents a supply of literature for distribution as well ?

A. Yes, and of course if a man wants an immediate answer to enquiries, it is very convenient for the agent to have the matter at hand to answer him.

*By Mr. Wilson :*

Q. What check have you on them to show that they distribute this literature ?

A. We ask them to report at stated intervals and we have an Inspector of agencies for the United States who visits them.

*By Mr. Sproule :*

Q. Who is that agent ?

A. Mr. W. J. White.

*By Mr. Wilson :*

Q. It is not only to the United States but you send large quantities of literature to the Old Country as well ?

A. Yes.

Q. Who looks after that ?

A. That is under the control of the officers in the Old Country.

Q. Has it come to your notice that a large quantity is not distributed ?

A. It has been reported by the chief inspector of agencies in the Old Country that such has been the case.

Q. You don't know how long it has been going on ?

A. No.

Q. Nor the exact quantity ?

A. Nor the exact quantity.

Q. Who could tell that ?

A. Probably Mr. Preston can. We sent to our agents 337 cases by freight and express, containing 581,507 maps and pamphlets for distribution in Great Britain, the United States, on the Continent and in Canada. We also sent out 65,000 copies of the pamphlet entitled "Going to Western Canada," making a total of 886,322 pamphlets that were distributed from the head office during the year. Besides that I have here a list of the pamphlets published: "Western Canada," "Settlers experiences and delegates' reports," which is a book made up of letters and testimonials received from the settlers themselves in Manitoba and the North-west. We sent our agents out to get these letters personally from delegates from the United States. We gathered them together in this book and they are of great value. "Book of Views," "Descriptive atlas of Canada," a small pamphlet "Le Manitoba," another small leaflet "Le district de la Saskatchewan," a Swedish pamphlet, "Wonders of Western Canada," "Ten Minutes Talk," a little Russian pamphlet, and then there was some illustrated matter.

*By Mr. Moore :*

Q. Where was it printed ?

A. The literature printed in English and French was printed through the Queen's Printer. The little Russian pamphlet, of which there were 3,000 copies of 30 pages each, was printed in the State of New York, I think in Troy or Albany. I don't think they have any type here with which to print this. We have pamphlets in Bohemian, German, Swedish, French and English, Danish, the Scandinavian language, Icelandic and Hungarian; wherever these can be done through the Queen's



Printer they are, but occasionally we have to go outside because of their not having the type, we have to do it.

#### IMMIGRATION BUILDINGS.

The immigration buildings are situated at Halifax, Quebec, Winnipeg, East Selkirk, Yorkton, Dauphin, Calgary, Brandon, Red Deer, Port Arthur and Regina. All of these have been occupied during the year, and the general report from those who have come into the country, is that they have been very satisfactorily taken care of.

#### NUMBER OF GALACIANS, HOW ASSISTED, AND WHERE LOCATED.

The total number of arrivals during the year—but before I go on to that, permit me to deal with a question raised the other day as to assistance given to the Galicians. There are four colonies which have had relief. At Edmonton there is a colony that consists of about 4,000 people, and the number of people relieved was forty-five at a cost of \$493. At Saltcoats colony the total number relieved was fifty-six at a cost of \$738.01. At Beaver Hill settlement the total number assisted was sixty-five and the amount of relief \$1,611.64. At Crooked Lake there were 134 persons assisted at a cost of \$2,552.60; about \$5,000 all told for the Galicians, numbering now about 16,400, I think.

*By Mr. LaRivière :*

Q. Does that include Stuartburn settlement?

A. No, I think no assistance was required there.

*By Mr. Wilson :*

Q. This is what you gave them last year?

A. Yes. For this the Department has taken liens on the property.

Q. This is a gift—it is not charged?

A. Yes, all advances we make outside of regular immigration work are charged up as a lien against each homestead.

#### TOTAL ARRIVALS FROM UNITED STATES AND THE UNITED KINGDOM.

The total number of arrivals this year, 1899: from the United States, 11,945—the committee will find that on page 5 of my own report—from Great Britain, of English and Welsh 8,576, of Scotch 1,337, and of Irish was 747.

Q. You did not do much with them?

A. Well, we are holding our own.

#### EXPENDITURE IN IRELAND.

Q. That is a matter of question. I see the expenses of the Dublin agency were \$6,859.44, of the Londonderry agency, \$3,274.31, making a total of \$10,133.75. Well, then there is a share of the miscellaneous expenditure, \$16,679.96, and bonuses to steamship agents and others, \$16,233.19, and then there is printing for Europe, \$4,777.42; I suppose there is a certain percentage of all this, and it does seem to me you are spending a large amount of money in Ireland for small results?

A. Well, it is generally admitted that for some reason the work in Ireland has not been as productive of good results as we would like.

Q. I see the Dublin agency costs \$6,859, why should it cost that much? It is on page H-14 of the Auditor General?

A. That includes the salary of the agent.

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Q. There is C. R. Devlin, salary \$2,000, travelling and living expenses, \$726. There is a whole lot of items here, and it does seem to me the whole thing is very extravagant?

A. I notice in looking over the items here that the salary of Mr. Devlin is included in that.

Q. Yes, that is \$2,000?

A. The salary of Mr. Webster is included in that too.

Q. Yes, that is \$900.

A. So that it includes the salaries and living expenses and office expenses of two men.

Q. Yes, and it includes the trip of Mr. Devlin to the North West Territories—\$150.

A. Yes, it includes that.

Q. Why should that have been charged to the department?

A. Well, the policy of the department is to allow our agents to make occasional trips to Manitoba and the North-west, so as to keep them acquainted with conditions there, that they may be better prepared for discussing Manitoba and the North West Territories with people who apply for information.

*By Mr. LaRivière :*

Q. It would be well then to select your agents from Manitoba and the North-West-Territories?

A. That would help us at the start, but they would grow rusty as time goes on, and would have to visit there occasionally to keep posted.

*By Mr. Calvert :*

Q. Would you propose to do away with that agency?

*By Mr. LaRivière :*

Q. Not necessarily, but it costs too much.

*By Mr. Clancy :*

Q. When you stated that there were 16,400 Galicians, did you mean for last year?

A. No, that includes all that have come to the country.

#### HOMESTEAD ENTRIES AND TOTAL ARRIVALS FROM THE UNITED STATES.

*By Mr. Sproule :*

Q. I notice that you say here that from the United States you had 11,945 immigrants and the reports of the actual entries for homesteads only represents 1,169, is it not?

A. That would appear to be the case.

Q. How do you make out that the balance of that 11,000 settled there? How do you know they settled there?

A. I will show you what our figures are and how they are made up. The arrivals at Winnipeg were 4,087.

Q. These are the arrivals by train?

A. Yes.

Q. From the United States?

A. From the United States. North Portal 2,000, Southern Alberta, including Coutts and Pincher Creek 1,000, Emerson 198, Gretna 683, Morden 162, Crystal City 34, Killarney 97, Deloraine 101, Lethbridge 363, Fort McLeod 28, St. Mary's 377, Brandon 46, Carberry 20, Virden 3, Nippewa 97, Portage la Prairie 158, Prince Albert 11, Maple Creek 21, Regina 433, Lake St. John 906.

Q. How do you distinguish them? I take it many of these would come through Winnipeg.

A. There are the waggon and rail immigrants, and those who came by rail are in the other statement. I am now speaking of those who drive across the international boundary.

Q. Do they drive all the way to Prince Albert?

A. Yes, they drive long distances. We came across one man last year who started from away down in Kansas early last spring, arriving in September; it took him six months to make the journey and he was fatter and better when he came in, than when he left home. Some of them think nothing of starting for a drive right across the continent.

Q. I want to find out, in case your entries are checked, how do you account that of those that came in, you say 11,045 came in, but that the number of Americans who have taken out homesteads coming in from the various States, there have been only 1,169 entries, is it not?

A. Those are the figures in the Deputy Minister's report.

Q. Then I take it that for the balance of these you have only the information of various parties coming into the country by seeing them individually and you have no other information except that?

A. Of course we have a good deal of what would be considered pretty reliable information, that these men who come in, settle in the country. A man drives across the boundary line —

Q. I mean their own representations. I know many of these perhaps who would buy land from the Canadian Pacific Railway that you would have no report of whatever; I do not think all the actual homestead entries here would represent the whole of them that came in, but I mean, have you any other information that enables you to determine it with approximate correctness beyond that, the homestead entries.

A. We have the reports of our agents that a certain number of Americans, for instance, have made their way up to Prince Albert district and are settling twenty-five or thirty miles from Prince Albert. We have a report from the Edmonton agent that there are fifteen or thirty land seekers from Nebraska who were driven out by him from Edmonton and that these men all selected their land but they might not have made their entries for some time afterwards.

Q. But when they make their entries they should appear here?

A. They should of course.

#### PER CAPITA COST OF IMMIGRANTS.

*By Mr. Calvert:*

Q. What is the average cost of each immigrant taking all countries?

A. It is about \$8.

Q. So that when an Irishman cost \$13.50 that is only \$5.50 more than an immigrant from other countries and naturally you think he is cheap at that price?

*By Mr. Featherston:*

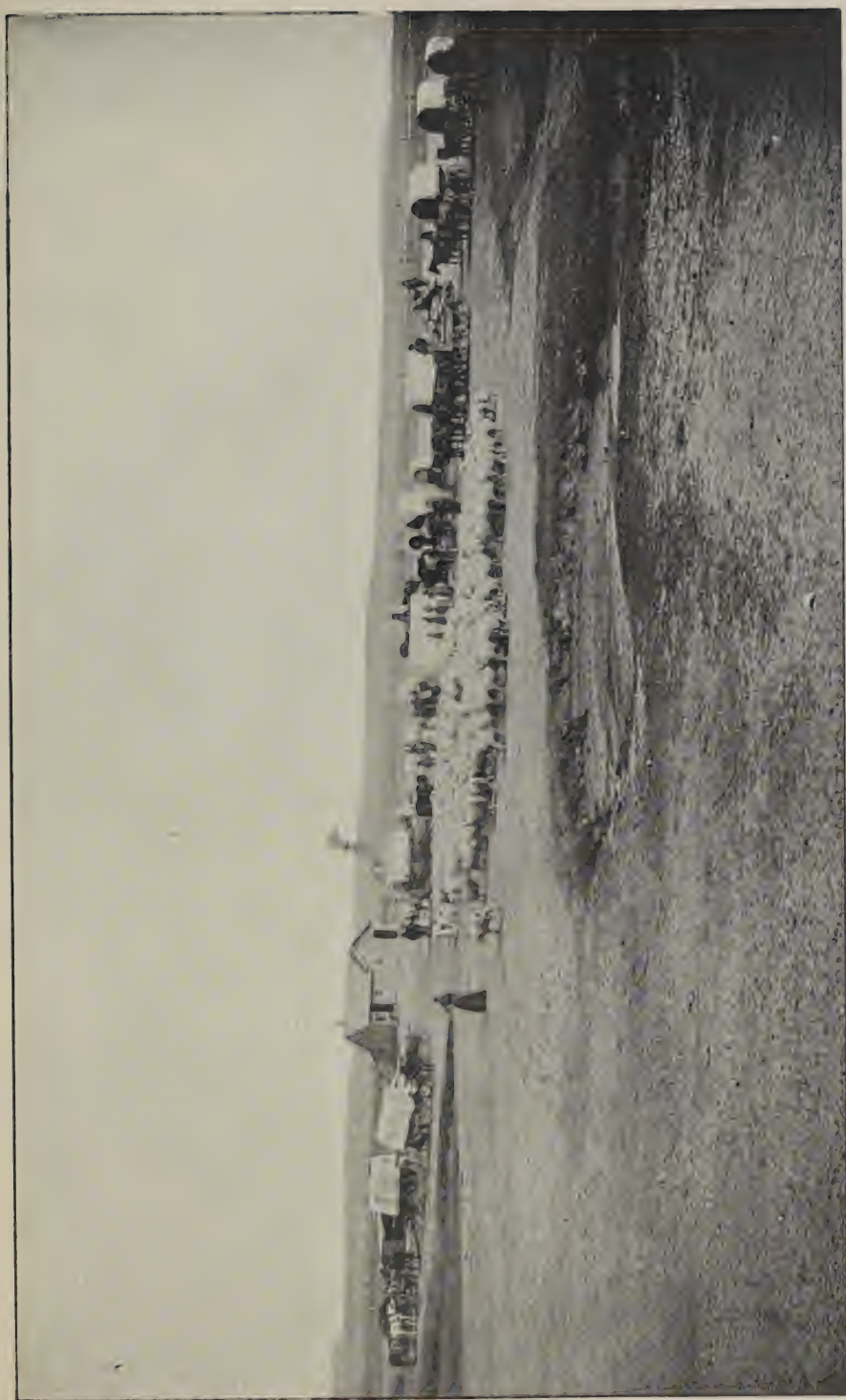
Q. You think he is worth that much more?

A. It cost \$8 or \$9 per immigrant figuring on the total amount expended, with the total number coming into the country, but it is pretty hard to tell what each individual costs.

#### TOTAL ARRIVALS AT CANADIAN OCEAN PORTS IN 1899.

The Rainy River district which is being settled by Mr. Burris, who is our agent at Port Arthur, is credited with 227 people from the States. Lake Temiscamingue





1.—RENDEZVOUS OF NEBRASKA SETTLERS BEFORE STARTING FOR CANADA, 1900.





2—GROUP OF NEBRASKA SETTLERS ABOUT TO START FOR CANADA, 1900.







3—NEBRASKA SETTLERS EN ROUTE TO LACOMBE, ALBERTA, CANADA, 1900.





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in the Montreal district, which is being settled by the colonization society of Montreal, it is credited with 973 according to their own reports, Lake St. John district with 996 from the States. The total arrivals at the ports of landing, at the ocean ports number 47,136; 2,059 were steerage passengers who entered at Canadian ports but who were destined for the United States. As I have stated before, these were classified by our officers at the ocean ports and are not mixed up at all with those whom we claim as being settlers for Canada.

## IMMIGRATION OF CHILDREN.

Besides the general work of immigration our branch is also charged with the inspection of immigrant children. This has been carried on as usual, the children and homes having been inspected by officers of the department.

*By Mr. Wilson :*

Q. What is it you allow for children per head that are brought in ?

A. Two dollars per head for certain classes.

Q. And that is given to the persons who are in charge of them ; they are brought out by institutions, are they not ?

A. Yes, the Barnardo Home is one institution. These were not workhouse children.

Q. Do you have them inspected as to their state of health ?

A. A medical certificate must be produced by them when they embark and presented at the port of landing. If it is not produced at the port of landing, our officer has the child inspected and the amount of the cost of this examination is charged to the parties claiming bonus.

Q. You do not have that done by an officer of your own ?

A. The only officer we have, that is under salary, is Dr. Corbett, of Winnipeg, who gets a salary of \$50 per month, I think it is.

Q. I presume this examining is done in the Old Country ?

A. It is done by the Local Government Board or by the Homes themselves.

Q. There is no cost in connection with it ?

A. No.

Q. Where do you have your examination ?

A. At the port of landing before they leave the ship. Our immigrant agent at Halifax or Quebec attends to it.

Q. Well, and you say that the party getting the bonus has to pay for the inspection ?

A. That is charged up to him, yes.

Q. I would think that would take the biggest part of the bonus ?

A. They are supposed to do the inspecting in the Old Country. It is taken for granted that it is done in the Old Country, under the bonus arrangement ; but if one should happen to come out not having the proper certificate of examination, the examination has to be made here.

Q. It is only in cases where they do not have a certificate ?

A. Yes ; it is very exceptional that they have to be made here. The system was changed about a year ago as to examining children. Those of you who have been paying attention to the inspection of workhouse or pauper children, as they are called, will remember that the department paid the expense of the inspection, and the inspection was made only once, after the arrival of the child.

Q. When was that ?

A. In the year of its arrival. The child would land here after the opening of navigation, generally between the first of May and the first of August, and some time during that fall or the following winter, this child who had been placed with some outside parties by the society in charge of it, would be inspected by the Department and the cost of that inspection would be borne by the Department. The Local

Government Board in England took the matter up and arranged that it should be extended, so that the child should be inspected annually until it reached the age of 16 years, all inspections after the first year being paid by the Local Government Board, not by the Department, for which they send us a cheque each year to cover the cost of the recurrent examinations.

That about finishes the work dealing with Canada.

#### ADVERTISING IN THE UNITED STATES.

With regard to the work in the United States, I only wish to say that, having gone into that to some extent with the Committee, the advertising that is done by the department in the United States is pretty extensive. We have advertised in over 7,000 American newspapers having an aggregate circulation of about 7,000,000, and the States in which we have advertised are North and South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Texas, Kentucky, Virginia, Montana, Utah, Colorado, Indiana, Ohio, Michigan, Pennsylvania, Wisconsin and Illinois.

Personal supervision is given by our inspector of United States agencies, Mr. White, a practical newspaper man, over all advertising done by the Department. The number of papers was 6,840, to be exact, having a combined circulation of 7,250,000 per week; in 6,158 papers with a circulation of over 6,000,000. There was a three-column illustrated article on the growth of Canada and its advantages to settlers, with no cost to the Department.

*By Mr. Wilson:*

Q. Were these weekly papers?

A. Most of them; I think I am safe in saying nearly all of them are weekly papers.

The three column illustrated article, as I said before, cost the Department nothing, and appealed to about 6,090,000 readers. The papers are rural local newspapers, first-class weeklies and dailies and first-class farming papers.

#### DELEGATIONS OF UNITED STATES FARMERS.

In the United States we also have a system of sending delegates to inspect Manitoba and the Northwest and to make their report to the section of the country from which they come. These delegates in the majority of cases are chosen at a meeting of farmers called together by one of the agents. They appoint a couple of delegates to go to the North-west, that appointment is evidenced by a petition which is sent in to the department and upon the department being satisfied that the petition is one which it can endorse, it asks that the Canadian Pacific Railway,—the Canadian Pacific Railway generally, because it is the road that runs to the boundary line,—to give these delegates free transportation from the boundary line to the point they wish to visit in Manitoba and the North-west Territories.

Q. And return?

A. And return. It is always done unless the Canadian Pacific Railway has some positive reason for refusing.

Q. They have done that for years I think?

A. Yes, it has been going on for I don't know how long, but for some time. The number of delegates last year was about 378 as against 209 who visited western Canada in 1898. They came—

Q. There are none from the Eastern portions?

A. No, there may have been one or two but the number is almost nothing. The Canadian Pacific Railway, the Manitoba and North-west, the Calgary and Edmonton, the Qu'Appelle, Long Lake and Saskatchewan, and the Canadian Northern have all extended to the delegates transportation facilities.

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Q. That is in Canada, on the part of them in Canada. The Northern Pacific Railway, for instance, is an American road.

A. Yes, but it runs from the boundary through to points in Manitoba.

Q. It gave transportation on the Canadian portions of it, I suppose?

A. As far as I know, we get no reduced rates at all on the American railways, in the United States

*By Mr. Calvert:*

Q. The results are that you have something over 11,000 immigrants from the United States last year?

A. 11,945.

Q. Nearly 12,000.

A. It shows an increase of 2,000 over the previous year.

*By Mr. Sproule:*

Q. If you take the Americans who have taken actual homesteads it is 1,164.

A. That would show the number of entries but not the number of souls.

*By Mr. Broder:*

Q. That would be the number of parties taking up land?

A. Yes, it does not show the number of souls; for that the 1,160 would have to be multiplied by five.

*By Mr. Sproule:*

Q. Your report gives the proportion at a little over three?

A. Whatever it is, three or four. However, the number of souls that are represented by these entries are given in the annual report of the Deputy Minister. So it is not a question of average so far as that is concerned, it is just a question of what the officer reports. The official who has charge of that makes his own report. It is not in the immigration branch.

*By Mr. Clancy:*

Q. Can you give the committee the cost of advertising in the United States; you gave the committee the number of advertisements.

*By Mr. Wilson:*

Q. Of course the Auditor General's year does not fit in with your year?

A. I have it added up in my copy of the Auditor General's report.

The total at the end of the fiscal year in the United States was \$14,018.44; that will practically be the amount for the calendar year because the advertising begins in the month of March and continues for three or four months.

*By Mr. Clancy*

Q. Would it not be better, as the report does not deal with the calendar year, to take the fiscal year and give us the amount for the calendar year?

A. Yes, that is a system adopted by the accountant, and I will get that.

Q. And also the cost of delegates for the calendar year; I presume there was something paid for them, that would be 378 delegates?

A. I am not quite sure whether we could distinguish between the expenses of the delegates and the agents. A man will go to Yorkton, for instance, and the agent will meet him and drive him out to lands available there for homesteads and when he is done there, pass him on to another man. Of course it could be done, but it would take time.



Q. Take his expenses coming and going ?

A. He is not at any expense outside of that.

Q. Somebody must pay his expenses ?

A. He pays his own. The only expense we save him is transportation on the Canadian railways and livery. We pay no transportation on Canadian railways, and we make him pay his own livery to keep down expenses as far as possible.

*By Mr. Wilson :*

Q. These are people chosen by their neighbours ?

A. They are generally chosen by a meeting of the surrounding farmers, and then a petition is sent in to the Department that these men are appointed and asking for transportation for them.

*By Mr. Calvert :*

Q. Through the moral persuasion of our agents ?

A. Well, our agents are of course the men who tell the farmers what can be done for them by delegates. A farmer in Kansas or Missouri knows nothing about this system of delegates until they meet the agent. When the agent meets these men they say "we never see the Canadian newspapers and know nothing about the country." He gives them literature and they will probably say, "If we could see that country we would not mind going." Then the agent says, "Appoint a delegate and we will give him all the assistance in our power to examine the country."

*By Mr. Stenson :*

Q. This delegate goes to verify the statements made by our agent ?

A. As this delegate goes from point to point, our agent takes notes and before he leaves for the United States, he gets a report which is embodied in the "Settlers' experiences and delegates' reports." That is the last one published, which is based entirely on the reports by delegates who visited Canada during the year 1898 and probably some of them in the beginning of 1899.

*By Mr. Wilson :*

Q. I suppose if the agent is a tolerably smart fellow he helps to write it ?

A. I will not say the agent does not help but we have nothing to show that he does and the delegates' signature gives it all the authority we need.

*By Mr. Clancy :*

Q. That does not seem important enough to ask you to discriminate in the expenses ?

A. It would be almost impossible to do it I think.

Q. There has been literature sent also ?

A. Yes.

Q. That has been kept separate ?

A. No, but we can tell how much has been sent.

Q. Well, will you give us the cost, for the calendar year of course.

A. I may be able to give it to you here. No, I have got the United States and British coupled here. I can give you, however, how much was sent to the United States; that sent to our agent at Detroit in cases for distribution among the various agents, and also the quantity of literature mailed from the head office to individuals in the United States, in response to letters.

Q. I want to gather the cost of all literature sent from all sources to the United States during the calendar year ?

A. All right. Also in connection with the United States work there is the question of attending the State and County fairs, which is done every fall by our

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agents and as large an exhibit as he can possibly procure from the Department is made by each one of the agents at these fairs.

Q. That is a Canadian exhibit?

A. Of grains and grasses and the products of the country as far as they can be handled for purposes of exhibition.

*By Mr. Wilson :*

Q. You have a list of where they were held last year, have you?

A. Yes, I can get the list, but last year Canada was represented at the state fairs in Michigan, Ohio, Minnesota, Dakota, Nebraska—in fact last year in Omaha we continued an exhibit at the exhibition which was a sort of second edition of the Trans-Mississippi Exhibition of the previous year. We had a large exhibit there in 1898 and continued it last year. At these exhibitions our agents attend and deliver lectures and distribute literature.

Q. Do they deliver lectures at these fairs in the States?

A. Yes, they are all the time talking about Canada and one of the features is that they are very well listened to.

Q. An agent wants to be a good speaker?

A. A man who can speak and make himself clear is probably a better agent than one who can not.

*By Mr. Featherston :*

Q. I attended the Michigan State Fair at Grand Rapids last year and Mr. Grieve was in charge of the Canadian exhibit. It was a most creditable part of the fair and he spoke to them answering all who came along and telling them the resources of our country. There were five people there looking at the Canadian exhibit to one looking at any other exhibit.

A. I have no doubt about that.

*By Mr. Ingram :*

Q. Is Mr. Currie one of your agents?

A. Mr. Currie is agent at Stevens' Point, Wisconsin. He was in attendance at the Trans-Mississippi exhibition and also at the state fairs at Milwaukee and Chippewa Falls, and also at Eau Claire, Wisconsin, and at Milwaukee.

*By Mr. Clancy :*

Q. Before you leave that Mr. Pedley, of course I understand that the expenses incurred by the agent attending these State fairs is a separate thing; now the cost of preparing the exhibits. It is kept separate I understand?

A. Yes, but the agents' expenses are not kept separate.

Q. What is the cost of the exhibits for last year?

A. Some of the exhibits of last year, were two or three years old. They were got together up in the North West. I have not the figures with me but they can be obtained, showing what was spent by the Department in the way of exhibits.

Q. Will you take a note of it and give us the cost of the exhibits in the last calendar year?

A. Yes. We try to get up a good class of exhibits and pack and arrange them properly so as far as possible, to last two or three years. There is not much difference between the stock one year and another. At most, if not all of these fairs we get diplomas or prizes. At the Omaha Exhibition of 1898 we got several gold medals and diplomas which are in the Department. Last year we did the same, and at nearly all of the smaller fairs in the States, we get some specified recognition from the Directors as to the excellence of our exhibits.

Q. Canada is always able to do that?

A. Yes. In fact it has got to be so now that there is a general demand for the Canadian exhibit at all these fairs.

*By Mr. Richardson :*

Q. You spoke of an expenditure of \$14,000 for advertising in the American papers, what was the advertisement?

A. It was to put an advertisement, of up to 4½ inches, in each of the papers that are circulated by these large advertising firms in the United States. The advertisement is a summary, so far as we can put it compatible with economy and efficiency, of the advantages of Manitoba and the North West as a field for settlement.

*By Mr. Wilson :*

Q. It would be nice if you brought some samples of these papers to show how you put it?

A. It is an oversight on my part that I did not bring some of them.

*By Mr. Calvert :*

Q. You say that several thousand papers published a three or four column article upon the subject?

A. That is what we call a write-up?

Q. Some of these papers you had advertised in and paid for the advertisement?

A. Yes.

*By Mr. Parmalee :*

Q. You did your advertising through an agent?

A. Yes. There are three or four agencies that have practically control of that work. We have a great deal of advertising in local newspapers done by agents locally. It is necessary to have newspapers in sympathy with them in their locality to assist them in their work.

*By Mr. Richardson :*

Q. Is the advertising left to the discretion of the agent?

A. No, it is under the control and direction of our inspector of United States agencies, Mr. White.

*By Mr. Sproule :*

Q. In how many papers did you say you advertised in the United States?

A. We advertised in 6,840, that is the number given, having a total circulation of 7,250,000 in one week.

*By Mr. Parmalee :*

Q. That is a very moderate expenditure for advertising?

*By Mr. Wilson :*

Q. Yes, going into so many newspapers.

A. The papers are all checked over. You take, for instance, the Western Newspaper Union, Kelloggs, Lord and Thomas, McGinnis, the Zimmeenian, Hall, and the Chicago Union, for example, in which advertisements appeared, they run off the patents for millions of papers, and the number of enquiries coming from the United States to the head office, independent of those that come to the different agents that we never see because they are answered on the spot, is satisfactory evidence according to our Inspector, and also to the Department, that this advertising is reaching the people.

*By Mr. Richardson :*

Q. Do these papers send in a marked copy with the advertisement?

A. Yes, they are all checked over by the inspector before the account is paid. I do not mean to say that all the seven million papers are checked, but they give us a



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schedule of the papers they print the patent for and the inspector goes over each one of those papers and sees that the advertisement appears and checks it off.

I have left the Old Country work practically, entirely to Mr. Preston. I would have left the United States work to Mr. White had he been here, but he is unavoidably absent.

*By the Chairman :*

Q. And he is not likely to be here ?

A. No, I have not any idea that he will be here. He was in St. Paul yesterday.

*By Mr. Wilson :*

Q. I suppose you will have to appear before the committee again : there is a lot of information you have to get for us ?

A. Yes, I have taken a note of what was asked for, and I will endeavour to have it for the Committee.

*By Mr. Sproule :*

Q. Have you an account of the expenditure for immigration for the calendar year, the last calendar year ?

A. For 1899 ?

Q. Yes.

A. No, I have not figured it out.

Q. Could you conveniently give us that next time you come ?

A. I shall endeavour, but, I am not sure about it as that is a matter entirely for the accountant and I think it will be a pretty big job.

Q. I mean, if it is not too much trouble—I do not want to put you to too much trouble.

A. Yes.

*By Mr. Clancy :*

Q. I wanted to ask Mr. Pedley before he concludes, if he can apply the same rule by way of information to the Doukhobors and Galicians that came in during the last year ; I mean with regard to the number of persons over 12 years, because I believe the rule was somewhat relaxed with regard to Continental immigrants as compared with the European. Formerly, as I understand it, the bonus was paid for those who were over 12 years of age for European immigrants, while on the other hand it was only paid to those exceeding 18 years of age from the Continent.

A. By European, you mean those from the United Kingdom, I presume ?

Q. Yes, those from the United Kingdom.

A. Continental and European would be the same.

Q. I mean by taking the number you get the cost in each case in the same way.

A. Yes, in the case of the Doukhobors we paid a bonus of so much per head.

Q. On all of them ?

A. Yes, that was the understanding.

Q. And the cost of the Galicians ?

A. They came under the Continental bonus in the regular way.

Q. Will you be able to give us the next time the number of persons under 12, the number of women and the number of children constituting the whole of them. I mean males and females, not women and children ?

A. Of which ?

Q. The number of males and females altogether. The number of those who were about 12 years of age in both classes.

A. Of Doukhobors and Galicians ?

Q. Of Doukhobors and Galicians. The number of Galicians and Doukhobors, male and female under 12, the total number of males and total number of females of all Doukhobors and Galicians for this last year, for 1899 to the calendar year.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
May 4, 1900.

The Select Standing Committee on Agriculture and Colonization met this day, Mr. McMillan, Chairman, presiding.

The CHAIRMAN—We have Mr. Pedley before us again to complete his evidence and after that Mr. Preston is present.

Mr. PEDLEY—Mr. Chairman, when the committee rose last day I had completed the main part of my statement and have now just to lay before the committee some answers to questions put by members that day. I have here a classified statement of the employees of the Department engaged in the work of immigration, those who are employed at the head office and those in the various agencies of Canada.

*By Mr. Wilson :*

Q. Would it take long to read ?

A. No.

Q. Well then, just read it.

*By Mr. Clancy :*

Q. Would it not be better for Mr. Pedley to go on from where he left off with the agents in the United States; there is some information he was to give us and that will have the evidence kept in order.

A. One of the questions to which I was to procure an answer was, as I have it down, the total commission paid on the United States settlers during the year 1899. The amount paid is \$5,075. The total immigration expenses for the calendar year 1899, with the classification of those from Great Britain and the continent and the United States to Canada—

TOTAL EXPENDITURE FOR 1899.

Q. Well, I want United States.

A. Well, I have the total expenditure and classified expenditure in the United States, \$83,500, including salaries, expenses of agents, sums for advertising and commissions on settlers.

The total expenditure in Great Britain and Europe is \$80,000, including the expenditure made by the High Commissioner for salaries, and all the expenses inclusive of bonuses to continental and British steamship agents. The expenditure in Canada was \$224,363.35. This includes the salaries in Canada, contingencies at sea ports, expenditure made by Mr. McCreary, grant to the Quebec and Lake St. John Railway—

*By Mr. Wilson :*

Q. How much was that ?

A. \$8,000.

Q. This year again ?

A. Last year.

Q. Was that taken, as it was the year before, from the immigration appropriation or a straight vote ?

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A. Taken out of the immigration appropriation; I think it was not specified in the appropriation.

*By Mr. Sproule :*

Q. How much did you say the aggregate for Canada was?

A. \$224,363.35. I have mentioned a great many of the items included in this and there were also bonuses on Doukhobors, Queen's Printer's account for pamphlets, &c., the Repatriation Society of Montreal, the Girls' Homes, special editions of newspapers and advertising in Canada, and some miscellaneous items. In this statement the appropriations of two fiscal years overlap.

*By Mr. Wilson :*

Q. Have you got those all under one head?

A. This is for the expenditure in Canada.

Q. All under one head; you have not the newspapers separate?

A. Well, I have the special editions of the newspapers in which we have had advertisements.

*By Mr. Clancy :*

Q. Mr. Pedley was first to give us the number of persons classified in the following way: the persons acting on commission in the United States were to receive for every male over 18 years, \$3, for every female over 18 years, \$2, and for all others \$1.

A. All others \$1.

Q. Can you give the Committee the number of males and females over 18 years and the number of persons under that age?

A. Well, I have not that information here as I did not understand the question in that way. Where the male and female came in I understood it was with reference to the Doukhobors and Galicians.

Q. No, the Americans?

A. I have it down here as "Doukhobors and Galicians, male and female over and under 18 years."

*By Mr. Wilson :*

Q. You gave the Doukhobors all the same?

A. No, they got so much a head.

Q. That would not apply to this question?

A. No, it would apply in this way, that the bonus to the Galicians is to adults only.

Q. I understood it was to all.

A. Not the Galicians, but in the case of the Doukhobors it was made applicable to all, and I inferred from Mr. Clancy's question that he wanted to find out how many under the adult age came in.

*By Mr. Clancy .*

Q. If you refer to your notes I think you will find that it refers entirely to the United States settlers.

A. My note is this: "Amount of commission for 1899 and how many United States settlers for whom commission is paid took up homesteads."

Q. I wanted to know how many men over 18 years, how many women over 18 years and how many younger than that, came in.

A. From the United States?

Q. From the United States.

A. Well, I have not that information to-day, I will have to get it for you subsequently.



## IMMIGRANT ARRIVALS AND COLONIZATION.

Q. And how many settled on homesteads in Canada?

A. So far as that is concerned it would be an endless task. We would have to go into every individual entry in Manitoba and the North-west to identify each with our commission list. I spoke to one of our officers and he thought that possibly it could be done, but it would take a couple of months.

Q. The reason I ask was this, that the number of American settlers is so small.

A. Well, the records show that 1,169 settlers from the United States took up homesteads. Now then we will have to go to the land agencies to trace each individual entry to get the name and place of origin of the homesteader, and then from that we will have to trace it back to the commission book to see if he came in under a certificate and whether that certificate was issued by a commission man or a salaried agent.

Q. Is it the policy that every person coming in is supposed to take up a homestead and settle or does he come without any idea of becoming a settler in Canada?

A. Well upon that point the Department can have no policy at all, as far as I know. We expect every one coming in as a settler, will settle. However an immigrant comes to Canada and applies to the land agent to make entry for a homestead; if he is over 18 years of age and a male, or a widow over 18 years of age and a head of a family, the entry is granted.

Q. That is a very important point and I am sure the Committee is anxious to have some information. In the first place the Department finding these persons are coming in under our agencies in the United States, pays \$3 for every person over 18 years, a male, \$2 for every person over 18 years, female, and \$1 for each person under that. Is it supposed that when this price is paid to the agencies that the people on which it is paid are brought into Canada to homestead or to be turned loose and no further account taken of them?

A. The policy of the Department is that the agent satisfies himself as to the bona fides of those who receive what we call settlement certificates.

Q. Is that settlement upon the land?

A. It is just a name that has been adopted, "Canada land settlement certificate."

Q. What does that mean?

A. It means that the bearer of that certificate producing it at the Canadian Pacific Railway station on the boundary line and satisfying the agent that he is a bona fide settler, obtains a reduced rate ticket from that point to his destination.

Q. That means that he is to be located and that he enters upon a homestead?

A. I would not like to go that far.

Q. But he has to satisfy the agent that he is going to the point of destination and that he is becoming a settler.

A. He satisfies our agent before he gets a certificate, and then he has to satisfy the Canadian Pacific Railway agent before he gets a ticket, he then goes to his destination, say to Edmonton, but we have no control of him after that. We cannot compel him to take up land.

Q. You have agents at Winnipeg, they are taken in charge there I understand from the evidence given here, by the agents there, and they may be sent on further west, and, by the agents there, if they are not satisfied, they may be sent on still farther to other agents who have to see what becomes of these persons and locate them if possible?

A. Yes.

Q. Has the Department any information showing what disposal has been made of all these persons coming in in the manner in which you have stated?

A. The Department has not that information. We will say John Brown starts from Detroit and reaches Winnipeg and is directed there to Mr. Sutter at Edmonton, who takes him in charge when he arrives there and drives him 25 or 30 miles out to inspect the land in that section. If he makes a homestead entry in Edmonton we can turn up our records and trace the man; if, on the other hand, he is not satisfied with Edmonton and wants to try somewhere else he may make his way to Prince

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Albert or to the Dauphin district or to Swan River district where he may settle, but it will be difficult to trace him in the Department.

Q. Have you no agents in each of these places? We have agents in each of these places but we have not a passport system amongst the different agents in the North West, so that once the settler has handed in the certificate which he received from our agent in Detroit, the point from which he started, and received his reduced rate ticket at the boundary line, he is at liberty to roam all over the North West.

Q. So in that case Mr. Sutter takes no interest in him if he fails to locate him in his district?

A. He takes this interest in him, that if he finds the settler is not satisfied with the conditions around Edmonton, either with regard to the nature of the land or access by river or railway or nearness to the market, he may say to him "go to Regina" or to Dauphin, or a hundred other places in the North West, and I will give you a letter of introduction to our agent there." The man takes the letter and goes away, but he may never present that letter to our agent because some one on the way may take him to the Pincher Creek district in Southern Alberta or to some other place where he would settle; so that unless we introduced a passport system it would be impossible for us to trace him.

Q. So that he may return to Dakota just as readily as he could to Prince Albert?

A. There is no doubt about that.

Q. There is at least 90 per cent of those who came into Canada unaccounted for in that way, I think. Just turn it up.

A. We have 1,164 homesteaders.

Q. How many came in?

A. 11,945.

Q. How many of these were over 18 years of age?

A. I cannot tell you about that.

Q. Can't tell us about that, why not?

A. Not unless I go over their certificates.

Q. If you paid \$3 per head on them you certainly would have some information about it.

A. I can produce detailed information of the names of the parties on whom that amount was paid but we don't pay commission upon all the settlers from the States, only those sent in by commission agents.

Q. But those upon whom you did pay?

A. I can produce the full names of the parties on whom the commission amounting to \$5.075 was paid.

Q. Can you tell how many persons altogether, including those on whom a bonus, we will call it that for the present, was paid for the purpose of inducing them to come?

A. I can tell you the names.

Q. I do not want that, I want to know the number of males and females coming from the United States over 18 years of age of the whole number coming in last year?

A. Of the 11,455?

Q. Yes.

A. No, I cannot tell you that because there may be some that came in of their own accord, and on them we do not pay any bonus at all.

Q. But you say they came into Canada, and the inference is that they became settlers in Canada. What I am anxious to know is this, how many of those men are the Department prepared to vouch stayed in Canada and what is their condition?

A. Out of a total travel in and out of Manitoba and the North West of 127,281 people, the Department, according to the railway returns, is prepared to vouch for 38,757 who remained in the country over and above those who went out, this is known, they were counted by the conductors.

Q. Oh well, they are not officials of the government and that will hardly do.

A. That is one of the means we have of ascertaining the number.

63 VICTORIA, A. 1900

Q. We have a large and efficient staff, it would not be fair to say anything else because I believe we have a large and efficient staff. What we are endeavouring to do is to get information from all sources, not in a haphazard way by taking the conductors' record which may be considered as sort of collateral evidence, but to put it forth as a source of information, wholly unreliable. But what we want is information coming through, and sifted through, the hands of the large staff we ought to rely upon.

*By Mr. Campbell :*

Q. What are you trying to get at ?

*By Mr. Clancy :*

Q. My friend should know that I explained that at Winnipeg, as far as the ocean ports are concerned, we have records of the immigrants coming in there—will you be good enough to dispose of that part relating to the United States, dealing with the question relating to the immigration from the United States to the satisfaction of Mr. Campbell. I want to know out of the number of males that came from the United States during the last calendar year, how many of them became homesteaders ? I want to know how the Department is going to account reasonably for the balance. There is a wonderful discrepancy between the number of persons who appear to have become homesteaders and the number who have come in, and it is a very important thing for the Department to know what has become of these people, whether they have gone to the United States or are still in Canada. I am not going to make a statement or draw a conclusion, but this is the thing I want to know.

A. The source of information on which the Department bases these figures as I gave them the other day was in the first place the parties who report at Winnipeg and I think you will find from McCreary's report it is about 27,000 counted by him and his officials. We have an official on the train from North Portal to Moosejaw, who keeps track of the number coming across there.

*By Mr. Burnett :*

Q. A government official ?

A. Yes.

We have figures from the Albert Coal Company managed by Mr. Galt who gives us the returns of the declared settlers who came in over their railway via Coutts.

Q. If Mr. Pedley will permit me, I want this not from the railway company but from the officials of the Government.

A. This is from a Government official.

Q. No, it is from the railway official.

*By an Hon. Member :*

Q. The Government has an official.

*By Mr. Clancy :*

Q. You did not say so, did you ?

A. On the line running from Coutts to Lethbridge, we have no Government official, but wrote to the company asking the number of declared settlers that came over their line crossing at Coutts. There are some thousand now in the Alberta District who came in there last year, from Idaho and Utah and are settled in the new irrigation district that is being perfected by the Alberta Irrigation Co. who are interested as much as the Government in the colonization of the settlement. This is corroborated by the Dominion Lands agent at Lethbridge.

Q. Of course there is no doubt that appears to be a very reasonable statement to make, that the railway company is anxious and that persons do come in there. We are dealing now with an entirely separate matter, with the number of persons



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that came in through the efforts of our own machinery, by our own agents and such other machinery as they may have employed by way of paying bonuses. What we are anxious to do is to see the final outcome of that by settlers to Canada and those we have paid money to bring in.

A. When once you start into that phase of the problem of presenting the result of the work of an agent, we are getting into rather uncertain territory simply because a man may be working in a State five or six years. Some of them, for instance some of our agents have been working for several years. They may have laid the foundation of a movement six years ago that is only realized this year, or it may be realized in another State and it might be impossible to give any credit to any one in particular.

Q. I am not asking you to separate the work of the agent but of the whole agents or it will not be necessary to discuss that part of it, as Mr. Pedley will see. I admit with him it would be an unreasonable question but I am asking the result of the work of the whole of them.

No answer.

*By Mr. McHugh:*

Q. Is it a fact that immigrants come into the North West from the United States. There may be four or five or half a dozen of them together, who get into the hands of agents and buy land from them without ever going near the homestead office. I am speaking of cases I saw myself. A band of four or five of them would go to the agent in Edmonton, or these get off at different stations on the way and meet in with persons there who tell them there is a good land near and perhaps they buy it. If they find there are nice properties they buy them and don't go to your agent in Brandon. They become settlers all the same. Is it possible for the Government to know what became of them if they drop off between Winnipeg and Edmonton?

A. The only possible way of keeping in touch with a man of that kind would be by direct correspondence, but we have no means of communication with the man who went to a station, got off, bought land from the Canadian Pacific Railway or a land agent, who is not a homesteader.

*By Mr. Clancy:*

Q. I do not know if he has personal knowledge if there is any arriving from the States in that way.

A. They came from California, Missouri, and Minnesota. I saw them get off at different stations and they purchased land from private parties.

Q. Of their own accord?

A. No, some of these were sent in as delegates by an agent of this Government. Then there was a meeting in their respective towns got up by an agent, a Canadian agent who got them to send a delegate to see if they would not settle a little colony of them in Canada.

Q. Speaking of railway returns, do you take it from the railway returns which shows passengers coming in having effects with them as settlers?

A. Do we do what?

Q. Do you mean you count that class of people or people who come in whether they stay or not?

A. The conductors' returns furnished to the Department show the total travel of all kinds. They count the travellers of all kinds and descriptions coming into and out of Manitoba and the West. That system was introduced some two or three years ago, and as a result of the system we find the balance into Manitoba and the West is 38,757 over those going out.

Q. That is, who have remained in the North-West over and above those who went out.

A. I do not say whether they remained or not but I say the conductors tell us that so many went out in 1899, and so many came in.

Q. Does the Department investigate the freight that is brought in by these people? Supposing a settler comes into the country and has settlers' effects. He pays freight on the effects; that can be found out from the freight agents. Has there been any effort made to ascertain that number?

MR. A. No, we have not gone so extensively into the tracing as to get the freight returns from the different railways as to what freight was brought in and who brought it.

Q. And the class of freight?

A. Well, I think the customs returns will show that; that is done entirely by the customs officer.

*By Mr. Clancy:*

Q. Now if we keep to that part of it, namely, those persons who have come from the American side. I understand that any persons leaving, there is a complete account of them kept, and handed on from agent to agent until there is some disposition made of them.

A. A man is furnished by the agent in the place he leaves with a letter of introduction to the agent in Canada.

Q. Each one?

A. Each head of a family.

Q. But when he comes to Winnipeg, what becomes of him then?

A. When he gets to Winnipeg he is directed to go to Mr. McCreary's office and consult with Mr. McCreary.

Q. Is he not met at Winnipeg?

A. Yes, every train is met at the boundary.

Q. And they are practically taken charge of?

A. Every man on the train is questioned as to where he is from and his destination.

Q. Is there a record of that?

A. Well, there will be a rough record in the note book of the official, but I don't think it has been extended into an office copy.

Q. But there is a record kept that is sufficient to satisfy the Department, I suppose?

A. Yes.

Q. Well, following that you are not done with him until you have seen him settled or some other disposition made of him, but you endeavour to settle him on a homestead if you can?

A. We endeavour to settle him, we take him to a point where we ascertain from enquiries from himself, if he is satisfied. Once he has inspected the land we assist him to make an entry if he wants to. If he does not and passes on to another point, he passes out of our control.

Q. I don't want to prolong this, but I want to ask you if you can give the committee this information: how many persons over eighteen years of age came into Canada in the last calendar year?

A. From the States?

Q. Yes, we are dealing with them; male and female separately above the years of eighteen, that is your limit?

A. How many persons came to Canada from the United States, male and female separately?

Q. Yes. Now, how many under that and how many of these have been settled on homesteads?

A. That will be an interminable question.

Q. Well, it is very reasonable.

A. It is very reasonable, I admit, but it requires the canvassing of all the entries made in all the land offices.

Q. I have no hesitation in saying to the Committee that if they have failed to do that they are remiss in their duties, and we should start to-day and make them

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carry out that, because it is very important. I am complaining of the want of information, even with the increased force. Now, there is another question I want to ask Mr. Pedley to conclude that: what, so far as the Department is aware of, has become of those who have not become actual settlers?

Mr. STENSON.—Do you mean bonused as well?

*Mr. Clancy:*

Q. They are separate, Mr. Pedley knows that. Are you prepared to state, Mr. Pedley, now or later on, how many of these that have been bonused—that is probably not the word to use, because after all the sum paid to officers who are paid by commission in each territorial district, as I understand it correctly, under our own agents in the United States—how many of those who have come in under such circumstances have been settled on homesteads, and are you prepared to give them?

A. No, I do not think I could get it, to be frank with the Committee.

*By Mr. McNeill:*

Q. I think an arrangement could easily be made to get that. The municipal officers should be able to provide information regarding those who came in to each municipality. In Ontario that information could easily be obtained.

A. The system of taking statistics in Ontario is much more complete than it is in the North-West.

Q. I am not speaking of existing statistics but of statistics that can be easily obtained, that we want and that can be obtained, I think, in some such way as I suggest.

A. Unless you have regular municipal government I do not think that could be got, unless you put an officer after each man.

*By Mr. Sproule*

Q. I see here that Mr. Burriss says: "The following settlers have arrived from the United States this year, and are located in these districts: 147 males, 27 females over 18 years of age, and 53 children. From England 2 males, 2 females and 14 children. Total, 243." That is at page 197, part II. That is one individual agent's report; if the other agents all reported like that it does not seem to me it would be hard to get that information.

A. Well, Mr. Burriss, you will also note further on, says: "I have not been able to keep track of several families who came into Canada in their waggon." Now if you will bear in mind the list I handed you the other day, it will show there is a large number of people who drove in over the frontiers, and these are only incidentally taken note of, because they drive in at all seasons of the year, and by day and night.

*By Mr. Clancy:*

Q. Does Mr. Burriss show where these people come from?

A. As far as Mr. Burriss is concerned, he occupies a different position to the other United States agents. Mr. Burriss is engaged in settling a few townships a few miles out from Port Arthur. These districts are a little way from Port Arthur and include the White Fish valley, O'Connor township, Gillies township, Paipoonge township, Oliver township, Rainy River, Thunder Bay, and the Slate River valley. Now Mr. Burriss is specially engaged in the settlement of these five or six townships, which have been set apart by the Ontario Government on practically the same settlement conditions as Manitoba and the North West. If Mr. Burriss does as he has done for the last two or three years, he will go to the States and spend four or five months there getting settlers. When they come in to Canada he is immediately able to identify these men, because he has met them and canvassed them in their States. They go to Port Arthur and he can easily make a register of them and



where they come from. If Mr. McInnes, or any of the other agents were to accompany the men they induced to come to Canada, they would be in exactly the same position as Mr. Burriss.

Q. Mr. Pedley, permit me to ask you a question: I understood you to say in the early part of your evidence that all these persons came to Winnipeg as a rule—I am speaking of the class that came from the agencies of our own, when they landed there they became in the charge of some person at least?

A. Yes.

Q. Now, then, what the Committee asks is what disposition was made of these persons having come there with the knowledge of these officers who are there for the express purpose of seeing just what became of them and of assisting them in every way, what is to hinder these officials from giving such information as I now ask?

A. The man who starts from the United States as a result of one of our agent's work arrives at Winnipeg and enters into consultation with Mr. McCreary, and if this man has Northern Alberta in view, and under the advice or direction of Mr. McCreary starts for Edmonton, and is there placed in charge of the agent at Edmonton, who does his best to satisfy the settler with a homestead or assists him to select land in and around that town. If he settles there, then the difficulty of tracing that man is obviated. But in case he is not satisfied with the land around Edmonton, and starts, say for the Swan River district, some six or seven hundred miles away, he may not go to see the agent there. How are we to trace him up unless we have a passport system?

Q. Is it not possible to trace him if he comes in as one of those persons upon whom we have paid a bonus?

A. As soon as he passes the boundary line the bonus is payable.

Q. Whether he settles or not?

A. Whether he settles or not. Some years ago every settler was given a bonus of \$1 if he settled on the land, and I never heard of any complaint that the revenues of the country were depleted by the number of those who settled on the land. They were very few.

Q. Mr. Pedley will hardly make a political speech here. Now that may be true, what we have to find is a remedy; whether it arose under a former government or under the present one, it is not our business to work politics here but it is to find a solution. I desire if we have a large class of agents strung clear over every state in the Union nearly that we expect settlers to come from, I say it is folly to say that these men could not have had more definite information than he has given to us so far.

A. The system that has been in vogue for years has been with the object of tracing, as far as possible, home to the Department the result of its agents' work, and, as I mentioned before, in former years, it does not make any difference under what government it was. I am talking about the various systems that have been adopted, for the purpose of showing conclusively, as has been suggested here, that the Government was not paying any money unless it got adequate return—one proposition was that the settler should produce evidence some time after he entered his land and the Government would pay him a dollar, and I say now that the number of dollars paid was not sufficient to warrant continuing that system. It proved nothing; agents were employed under that system, both salaried and on commission, but the departmental records, as far as I have been able to gather, show that there were very few people coming into Canada from the United States.

*By Mr. Wilson:*

Q. You have told us a great many times how many people came in, but I have not yet heard as to the kind of immigrants that came in, whether they were farmers, farm labourers, or any other class except it be—

Mr. STENSON—You mean from the United States alone.

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*By Mr. Wilson :*

Q. I mean from Europe in the first place and from the United States afterwards.

A. The only class of people that the department incurs any expenditure for are the bona fide agricultural settlers, that is a rule that covers the whole question.

Q. Now then, there is just one other question. I see Mr. Murray, who is, I think, the general agent in Scotland, isn't he?

A. Yes, his office is in Glasgow.

Q. He reports that there have been 1,803 parties coming from Scotland as settlers while your report only shows 1,337, his statement is on page 30, part II, and yours is on page 5 of the Annual Report.

A. Page 30.

Q. Yes, it is about the fourth paragraph.

A. Oh, yes, I do not doubt that at all. He speaks of 1,803 Scotch passengers; some of these may have been first and some second cabin, and would not be classified as emigrants; they might not have been emigrants.

Q. They may not have been emigrants—but if they came out to settle?

A. A wealthy farmer coming out from Scotland to settle may take the cabin passage, but for the purpose of keeping it within bounds as far as possible we only include steerage passengers, in our reports of immigrant arrivals.

*By Mr. McNeill :*

Q. With regard to those Galicians that came out here, is there any attempt made on the part of the Department to have a selection of immigrants before they leave their own country?

A. In what way?

Q. To see that those coming in here are fit and proper people to bring.

A. Well, I am not prepared to say that there is any particular examination made of these people in Galicia when starting for Canada. When they arrive in Canada at the port of entry, if they conform to Canadian laws, such as the quarantine regulations, they are admitted, we have no law to prevent them coming in.

Q. So that as a matter of fact the Galician authorities may dump their criminal population upon us.

A. I don't know about that. I suppose all classes may dump their criminals here; the percentage of criminals that came among the Galicians, of whom there are 16,400, is very small.

*By Mr. Clancy :*

Q. I suppose Mr. Pedley will give us that information later on—will you, Mr. Pedley, that you have taken a note of?

A. I shall endeavour to obtain that information as rapidly as possible.

## COST OF CANADIAN EXHIBITS AND ADVERTISING IN THE UNITED STATES.

There was another question asked that I may as well answer.

The total cost of the collection of exhibits made in 1896 and used in 1898 was \$2,734, and the collections, in 1899, \$2,787. These exhibits of grain, grass, &c., were collected over all parts of Manitoba and the West, prepared in good style, boxed and sent to the agencies in the United States and the Old Country for exhibition purposes, in the United States at the State and county fairs, and in the Old Country at the county exhibitions and horse shows, &c.

Q. Can you give us the cost of advertising in the United States?

A. The cost of the advertising in the United States for the calendar year 1899, as given by the accountant, and which he says must be considered only as approximate, because the fiscal year ends in June and the calendar year in December, and the accounts are overlapped from one to the other, but so far as he is able to make

it up in a rough way, the cost of advertising in the United States is \$38,500. That includes all pamphlets and advertising and the printing of a certain class of literature distributed in Canada and the old country, but which is charged to the United States.

Q. Will you say the total amounts paid to the persons acting under your agents there, the sub-agents, is \$5,075 ?

A. Yes.

*By Mr. Richardson :*

Q. Does that include pamphlet advertising or just newspapers ?

A. That includes atlases, &c., bought in the United States.

Q. Where are these printed ?

A. Usually at the Bureau, but in some languages where we have not the type, where we can get them. Then the atlases we got at 2½ cents apiece, printed in Chicago. They cannot be printed here for anything like the money. I do not know if they can be printed here at all. At least the departmental officers and the press agent of the Department went into the matter very thoroughly before the order was given.

#### EXPENDITURE AND DETAILS.

*By Mr. Clancy :*

Q. I see you give the whole cost of immigration at \$83,500?

A. This is given to me by the accountant, and I presume it is correct.

Q. I am just asking this as a matter of information. The service so far as you have been able to state to-day is \$38,000 in round numbers for the printing, \$12,900 would be paid to the agents, ten or eleven of them ?

A. We have ten, Mr. Swanson of Waterville, Canada, might be counted, and that would make eleven.

Q. That would be \$12,500, that would make \$56,000 in round numbers out of the \$83,000. What other services made up the difference ?

A. I had it stated here that the total expenditure was \$83,000; the advertising, \$38,500; and the total salaries and expenses of United States agents during the calendar year 1899 was about \$49,000.

Q. Over \$45,000, that includes the commissions, I suppose, does it ?

A. It is not discriminated here.

Q. Perhaps we can get that information separately later on ?

A. Yes, I think I asked him to let me have a slip showing the details.

*By Mr. Wilson :*

Q. Have you paid particular attention to the agents in Liverpool ?

A. Yes.

Q. What do you think of Mr. Jury's report with reference to tenant farmers—that they are better off there than in this country ?

A. I am free to confess that the reports of other agents than Mr. Jury, indicate that it is hard to get an immigration movement started.

Q. Mr. Jury says judging by their appearance they are as a class better off than the ordinary Canadian farmer.

No answer.

#### PRINTING OF LITERATURE FOR DISTRIBUTION.

*By Mr. Sproule :*

Q. I was going to ask some questions about the distribution of literature last year. How was the following literature published for distribution. "Western Canada," 77 pages, where were they printed ?



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A. They were printed through the Bureau, I think, by the *Montreal Herald*.

Q. By the *Montreal Herald*?

A. The *Herald*, I understand.

Q. Is that Christmas number that we had before the Public Accounts Committee, would that be it?

A. The same paper I think, yes.

Q. Then there are settlers' experiences and delegates' reports, 141 pages, 30,000 of them, where were they printed?

A. Through the Bureau in the same way.

*By Mr. Davin:*

Q. Through the *Montreal Herald*?

A. Through the *Montreal Herald*.

Q. Can you give us any information—you have not a copy of this with you, I presume.

A. I think so. There is a copy of "Settlers' Experiences" and there is a "Western Canada." (Pamphlets produced).

*By Mr. Sproule:*

Q. This is "Western Canada." This is not the same as what appeared in that Christmas number of the *Herald*. This is a different thing altogether.

A. You mean the special edition of the *Montreal Herald*. That was a single page advertisement. This is a regular pamphlet.

Q. What do these cost each, "Western Canada."

A. Eight and a half cents each.

Q. You got 100,000 of these?

A. Yes, they are all distributed and we are waiting for more.

Q. It contains 72 pages.

A. These all went through the Queen's Printer, so he is responsible for the prices. I suppose they are correct.

*By Mr. Davin:*

Q. Did I understand you to say they were printed at the Bureau?

A. The order was given at the Bureau.

Q. His language is, "Printed in the Bureau through the *Montreal Herald*."

A. That is not my language. The requisition was made on the Bureau.

Q. The printing is being done at the *Montreal Herald* Office?

A. At the instance of the Bureau, at the request of the Bureau.

*By Mr. Richardson:*

Q. Has the Bureau not got facilities for doing that work?

A. At times the Bureau is occupied with departmental work and cannot do other work. That is quite common, I understand.

*By Mr. Sproule:*

Q. Then this is another "Western Canada." Is this the experience of the settlers?

A. This is "Delegates' Reports and Settlers' Experiences."

Q. One hundred and forty-one thousand of them. Where were they printed?

A. That was given in the same order through the Bureau to the *Montreal Herald*. But it is not 141,000, it is 30,000.

## COST OF PRINTING IMMIGRATION LITERATURE.

*By Mr. Clancy :*

Q. Who ordered that printing to be given to the Montreal *Herald* through the Bureau?

A. Of course the Secretary of State has control, it is in his department.

Q. You don't know anything about that?

A. I know in general terms it was being done there; we corresponded with them regarding the details of the work.

*By Mr. Sproule :*

Q. This is "Delegates' Reports and Settlers' Experiences," you said 30,000?

A. Yes, 141 pages and 30,000 copies.

Q. And this is the price they cost, I think?

A. Yes, five cents.

Q. And you have a book of views I see. There are 80 pages and 10,000 copies.

A. This is different. This is a very nicely illustrated work.

Q. Where was this done?

A. This was printed in the same way.

Q. By the Montreal *Herald*?

A. Yes.

Mr. CLANCY—I see the Deputy Minister of the Interior here; perhaps he could state without inconvenience who ordered the work of the Bureau to be done at the Montreal *Herald* office.

Mr. SMART—I don't know; I presume the Queen's Printer.

Mr. CLANCY—But you have no knowledge?

Mr. SMART—I cannot say definitely about it; I understand they were over-worked.

Mr. DAVIN—Mr. Smart, the Queen's Printer would not do it of his own accord?

Mr. SMART—I suppose it would be the Secretary of State.

*By Mr. Sproule :*

Q. You have a descriptive atlas of Canada here, Mr. Pedley.

Mr. PEDLEY—Yes, that was a descriptive atlas of Canada, ten pages, 200,000 copies, which cost three and a quarter cents each.

Q. Where was that printed?

A. By Rand & McNally, of Chicago.

Q. Now you have bound copies I see of the same, 885 copies. Is this the bound copy?

A. No, the bound copies were in stiff cardboard or cloth covers, not paper, and were distributed to the members of the House of Commons and the members of the Senate.

Q. Then you have "Le Manitoba," 52 pages?

A. "Le Manitoba," that is a pamphlet printed in French with a small map attached, that cost two and a half cents each.

Q. Then you have "Le District de la Saskatchewan," a leaflet, 5,000 copies.

A. That is a leaflet printed at the cost of one-fifth of a cent each.

Q. Where were these printed?

A. These were printed at the Bureau.

Q. Printed at the Bureau, not by the *Herald*?

A. I don't know whether they were printed by the *Herald* or not, my own opinion is they were printed at the Bureau; we gave the Bureau the requisition and they filled the order but I don't know whether they were printed outside.

*By Mr. Clancy :*

Q. Were there some cases where you gave requisitions to the Bureau and some cases where you gave requisitions to the *Herald*?

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A. No, they all went to the Bureau.

Q. Were there any cases where it went to the *Herald*?

A. No.

*By Mr. Sproule :*

Q. You have a Swedish pamphlet with a map and schedule attached?

A. This was printed at the Bureau and cost  $4\frac{1}{2}$  cents each.

*By Mr. Davin :*

Q. I want to ask one question, Mr. Pedley: Some \$6,500 were paid for this descriptive atlas?

A. About that.

Q. Why was it given to a firm in Chicago?

A. I do not think you could get it done anywhere else at that price.

Q. You could not get it done in Canada?

A. Not at that figure; I do not think you could get it done at all in Canada for anything like that price.

Q. You are aware that in tens of thousands of them originally issued in the division between Alaska and Canada that it favoured the American contention?

A. No, I am not aware of that at all.

Q. You are aware of it?

A. No.

Q. Well, it was pointed out and we saw it.

A. Whoever pointed it out was not correct, because we put a note on the atlas stating what the contention was.

Q. Then what you mean was the map showed the contention of the United States and there was a correction in letter press at the end?

A. No, I mean a certain boundary, roughly speaking, was indicated on the map about which there was some dispute, and on or around one of the margins it was stated that the line there, was what the United States contended for.

Q. Exactly, that is exactly what I say; you say that the map showed the United States contention but that there was a note saying the map showed the American contention but that it was not correct?

A. Well, that would be the effect; if you will let me see the map.—

Q. It would not be the effect, it would be actually so.

A. If I had an atlas I could see what was on the map, I would not care to speak from memory only.

It was contended that we had said the boundary line was as the United States said.

Q. No, your memory is defective. I had the map and produced it myself in the House. Here was the notesaying the line in the map was the United States contention and was not correct.

A. Yes.

Q. Very well; now what I want to ask you is whether or not that note was printed on the maps issued from Chicago, will you say it was printed in Chicago?

A. I think so.

Q. Will you say it was not printed in Canada?

A. Yes.

Q. Was the printing an afterthought?

A. No.

Q. Were not thousands of them circulated before it was printed on it?

A. No.

Q. Are you sure of that?

A. Yes.

Q. Now, do you think it was a very businesslike arrangement to send out a map with false topography to be corrected by a letter-press note?

A. I think it would be very unbusinesslike to send out a map with a false topography and that was not done.



Q. But that was what was done.

Mr. DOUGLAS—It seems to me no other course could be pursued. Certainly Mr. Pedley, at the head of immigration, was not able to correct this boundary question and a plain note was placed on the map saying that it showed the United States contention which was not correct.

*By Mr. Rosamond:*

Q. Why was not the map made in the first place according to the Canadian contention?

A. I do not know that any maps issued even by the Department are made that way.

*By Mr. Ingram :*

Q. Is it customary for the Department to circulate documents before examining them?

A. No.

Q. How does it come then that this map was circulated?

A. It is not customary, but occasionally I say it might be done.

Q. You certainly, I suppose got a proof of this document, which was printed in Chicago, before it was circulated by the Department, surely they would discover this error and have it corrected before receiving it from the printer?

A. There was no error. The atlas stated what was perfectly true.

Q. If there was no error, where was the necessity of placing that foot note?

A. Because the United States contention is shown, and special attention is called to that fact.

*By Mr. Wilson :*

Q. Why should it be so at all—that is the question?

A. Well, the United States are in possession to a large extent of the disputed territory. A great many reasons may be stated why it should be shown, and it is shown in the majority of maps.

Q. That may be, but Mr. Chairman, I simply submit that that map got for general circulation and to induce people to settle in our country should be made as favourable to us as possible.

Mr. JAMES SMART, Deputy Minister of the Interior, replied to the question. He said, in the first place this atlas was got from Rand, McNally & Co., who are very large publishers of atlases, the largest perhaps in the world. The reason we went to them was, we were going to distribute these atlases in the United States and they published them so much cheaper than any one here could supply them. As a matter of fact there was a printer in Toronto came to me one day, and I asked him what the atlas was worth, and he told me he thought it was worth 25 cents; whereas, as a matter of fact, we only paid \$2.65 per hundred for them.

*By Mr. Clancy :*

Q. Does the hon. gentleman approve of it on account of the cheapness, even though it was wrong.

A. What was wrong—there was nothing wrong about it.

Q. The matter of delimitation was wrong, and it had to be explained in a foot note?

A. There was nothing wrong, it is the boundary to-day, and it was explained. I was explaining that map had to be used in the other atlases of the world which they publish.

*By Mr. Wilson :*

Q. Is not that giving our consent largely to their contention?

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A. No. I remember that map coming down, and I suggested that the foot note be placed there, myself, when I saw it.

Q. When was this?

A. Before they were completed. In the sample, in the proof, and we immediately wrote to Rand, McNally & Co., and we told them we wanted the following foot note put there, and it was put there. That was all there was about it.

*By Mr. Davin :*

Q. That is exactly what we object to.

A. I do not see anything wrong about that.

Q. I want to ask you—are you aware that the map that you thus issued was quoted in Washington to the Commission and placed on the table?

A. No, I doubt very much if it was.

Q. You don't know about it at all?

A. I do not know. Do you know that it was?

Q. Well, I was told it was.

A. Well, I don't know about that.

Mr. PEDLEY, Resumed.

A. In reply to Mr. Clancy, when he asked me whether it was customary to send out pamphlets without examining what was in them, my answer was that occasionally it might be done. I do not want any misunderstanding about what I mean. I said that it might possibly be done, but I know of no instance in which it was done.

Q. If it is possible to have it done, would it be probable?

A. It would be very improbable, but all things are possible, you know.

Q. But it would be very improper to do so?

A. It would be very improper.

Q. Are you aware that in the large pamphlet issued by Hunter, Rose & Co.—you are familiar with that, are you, that large pamphlet, that famous pamphlet, I think it was printed by Hunter, Rose & Co.—but anyway leave that firm out of the question—it was the illustrated pamphlet which was issued under Mr. Sifton's direction descriptive of the North West Territory—do you remember that?

A. I remember one pamphlet issued by Mr. Sifton, printed by the Bureau, not by Hunter & Rose.

Q. Do you remember the description given of Western Assiniboia—the country around Moosejaw and Regina?

A. I do.

Q. Are you aware that in subsequent additions it was entirely changed?

A. It was not entirely changed, but it was somewhat modified.

Q. You are familiar with it—tell me what modification was made?

A. I am not aware what the pamphlet was originally—it was prepared before I came into the Department.

Q. But you were subsequently acquainted with it?

A. Yes.

Q. And with the corrected pamphlet?

A. I am.

Q. Will you tell me what modification was made?

A. Well, the modification, was I think, to keep in the background the disadvantages of this section of country, and put in a little more emphatic language the attractions of that country.

Q. You have used the word “disadvantages”—the disadvantages of the country around Regina and Moosejaw—tell me what are the disadvantages?

A. Well, you are not asking my own personal opinion, I presume, but from the standpoint of the pamphlet.

Q. I am asking you in what sense you used the word disadvantages?

A. I am speaking of the pamphlet.

Q. You have used the word disadvantages—what are the disadvantages of that district?

A. You must allow me the privilege of speaking —

Q. I want an answer to my question, you are an officer of the Department, of the Interior, tell me, what are the disadvantages of the section around Moosejaw and Regina.

A. I submit it is not fair to tie me down to answer that question until the pamphlet is produced and I am able to show the revision that was made.

Q. I have no objection whatever to have Mr. Pedley recalled and to examine him on that, but he spoke of personal familiarity with it.

A. I am familiar with the facts that at the time that change was suggested, and I remember the object that was in view, when the change was made, but when you tie me down to the particulars and exact words or what cropped up at that time, I cannot do it.

Q. I was not tying you down to any particulars; you are an officer of the Department?

A. Yes.

Q. The head of the Immigration Department?

A. Yes.

Q. Deeply interested in the North West?

A. I suppose so.

Q. Then I repeat to you, what is the meaning of your expression—I want to know what are the disadvantages of these districts?

A. There are certain, I suppose.

Q. Now, sir, I want to know, by saying “disadvantages of these districts?”

A. Before I answer that question I would like to have the pamphlet here so I can see just exactly what corrections were made.

Q. I am not dealing with the pamphlet, but with the fact that an officer of the Department of the Interior states here, the one place more strongly than the other, “the disadvantages of these districts.” I want to know from you what you mean by “disadvantages of these districts?”

A. Probably I could answer better by saying that in the first pamphlet the ordinary reader might believe there were disadvantages in the Regina district, and so in order to remove that objection we so modified the pamphlet as to show that there are only advantages there.

Q. I am quite satisfied with that. Now I want to ask you is that pamphlet—that large pamphlet—so prepared as immigration literature or not?

A. Yes, I think I am safe in saying that.

Q. For immigration literature. You have just told us that after it was prepared a change was made so that the pamphlet should show the advantages of the district and not indicate the disadvantages. Will you tell me how it came to pass that pamphlet was issued from the Department of the Interior, and under the supervision of the Immigration Department which held forth to the world that the Regina district and the Moosejaw district had disadvantages from a farming standpoint. How did it happen?

A. It happened, I suppose, that in the original pamphlet certain statements were made that might be construed as representing that the Regina district had disadvantages?

Q. Is that a euphemistic way of saying the literature was incorrectly prepared?

A. I am not prepared to say that in the changes made one single fact was changed.

Q. Well, we must have the pamphlet?

A. We must have the pamphlet to see what the corrections were.

*By Mr. Calvert :*

Q. Who prepared the pamphlet?

A. It was prepared by an officer of the Department before I came there; I am not sure who was responsible for it, and printed by the Bureau. The artistic work I think was done through Mortimer & Co., here.



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*By Mr. Davin :*

Q. When I was asking you after you said that occasionally a pamphlet unsupervised might get out you said in regard to that map there was no error and gave as a reason that the United States are still in possession ?

A. I don't think you correctly understood me. What I meant to say was this, that our statement in so far as that boundary line between Alaska and British Columbia, or the United States and Canada, was not incorrect.

Q. You mean the topographical statement ?

A. I mean the statement of the atlas, taken as a whole, does not contain an incorrect statement as to that boundary line.

Q. Then the delimitation in the map was not incorrect ?

A. I am not saying that. I am saying the atlas as a whole —

Q. Do you mean to say that an atlas as a whole with a wrong delimitation is correct ?

A. If the map —

Q. You mean the line in the map was correct ?

A. I do not mean to say that at all. I mean to say that there was a line which shows this place there with reference to some disputed territory between Canada on the one hand, and the United States on the other, and there is a foot note in the atlas which states that this is the line which is claimed by the United States government.

Q. Was that line correct ?

A. I am not in a position to say. I understand it is disputed territory.

Q. Then you have no opinion on that ?

A. I am not-opposed to have an opinion on it. It was referred to a commission.

Q. My friend Mr. Campbell said I did not want a correct map. Would it be a correct map to have such a map as would give from a standpoint of Canada an incorrect delimitation ?

A. Well, I don't know about that.

Q. You cannot answer that ?

A. Would it be incorrect to have a map —

A. I will repeat the words. Would it be a correct map that would have from the standpoint of Canada's contention as to the boundary between Alaska and Canada, an incorrect delimitation ?

A. Have I to answer that on the assumption that the territory is undisputed or is disputed.

Q. Does it not imply there is a dispute between the two countries ?

A. Before I answer that question I have still further to know whether there is any disputed territory, because what is correct from one standpoint, might be incorrect from another.

Q. I see now. I will repeat my question to you—the question is this: There is a dispute between Canada and the United States as to the proper line of delimitation between Canada and Alaska. I ask you would it be a correct map that would give a boundary line that from the standpoint of Canada was incorrect ?

A. It would depend very largely upon the views of those amongst whom the map was circulated.

Questions of this kind objected to by Mr. Richardson, on the ground that they were not within the knowledge of the witness.

The CHAIRMAN—You have put the question whether this is or is not a correct map to publish.

Mr. DAVIN—That is not the statement.

The CHAIRMAN—You are not going to interrupt me. That map was published, published in a foreign country, the same as any other map would be published, but when the Department of the Interior got that map and found it in error they had a foot note put there to correct it. Now, I don't think this matter of a map has anything to do with the work of immigration.

*By Mr. Davin :*

Q. I want my question answered and the question I submit is : I want to have an answer from this officer of Canada, whether in his opinion a map incorrect from the standpoint of Canada can possibly be considered a correct map.

A. That is if it gave the boundary absolutely ?

Q. If it gives the boundary incorrectly.

A. Absolutely incorrectly, an absolute boundary ?

Q. How would you define it as a boundary ?

A. It may be a provisional boundary, there may be disputed territory.

Q. I ask you, can that map be correct if it is incorrect from the standpoint of Canada ?

A. Can that map be correct if it is incorrect from the standpoint of Canada ?

Q. Yes.

A. Well, if the Canadian position is correct why then the map may be incorrect, but if the Canadian position is incorrect why then the map may be correct.

*By Mr. Clancy :*

Q. Before you leave the map you know that from the standpoint and contention of Canada this map is not correct, do you ?

A. I understand that there is a disputed territory between Alaska and Canada ; the Canadians contend—,

Q. I want an answer and answer it directly ; do you or do you not know that the map sent out, one of which I hold in my hand, is an incorrect map from the standpoint of the contention of Canada ?

A. I don't know from the standpoint of geography whether—

Q. Do you refuse to answer the question I put ?

A. I don't refuse to answer the question, but—

Q. I submit, Mr. Chairman, the question is : does he or does he not know that the map in question which has been sent out is an incorrect map from the standpoint of the contention of Canada ?

A. I am prepared to answer that question by saying that this atlas as distributed by the Department of the Interior regarding the Alaskan boundary, as a whole, is correct.

Q. I appeal to you, Mr. Chairman ; I have asked Mr. Pedley to state whether he knew or not that the map in question is one which from the standpoint of the contention of Canada is an incorrect map ?

A. That is, considered entirely as a map ?

Q. I am not asking you as a map, I am asking you as from the contention of Canada.

A. When you say map, do you mean the plate or the whole atlas ?

Q. I mean the map.

A. This map as circulated by the Department shows both boundary lines, so it is perfectly correct.

Q. There are two maps, are there ?

A. No ; there is a map showing the Canadian and American boundary.

Q. Mr. Smart, if I understood him correctly, said that the publishers in the United States offered such favourable terms that he was disposed to accept them, that a sample was sent in for which special terms were desired, but they offered favourable terms because they were publishing this kind of map with their contention, that he adopted that with the protest of a foot note put on that map without farther change ; is that correct ?

MR. SMART—That is right.

Q. Now I am going to ask Mr. Pedley after that statement has been made, when a foreign map was adopted without change—I mean in the delimitation—does he know that that map as it stood then, was contrary to the contention of Canada ?

A. What I knew—at least what I thought I knew—was that the contention of the United States as to the boundary line between Canada and the United States was

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disputed by the Canadians; that is what I knew, but I am not prepared to state which of the two is correct.

Q. And the American map practically was sent out with their own contention?

A. The American contention was included on the map as well as the Canadian contention.

Q. I ask if you knew the American map with their contention was sent out with the correction of a bare foot note as explained by the Deputy Minister?

A. As far as I know the atlas showing the American contention.—

Q. Now, that is not the question—

A. —was issued with the foot note.

Q. Now, I must protest, Mr. Chairman, that is not the question. I asked Mr. Pedley, who is an official of the Department, if he is aware the map was sent out with the bare letter-press as explained by the Deputy Minister of the Interior, with a contention contrary to Canada; I don't want a speech; I want yes or no.

A. Well, the atlas was sent out with the explanation as given by the Deputy Minister.

Q. A United States map?

A. A map published in Chicago: I do not know whether it is a United States or not, it is a map of Canada.

Q. That is your answer to my question?

A. It depends on which question you mean.

Q. Now don't let us get smart over this?

A. I think I have answered that question already.

*By Mr. Sproule:*

Q. I have here "Homes of Western Canada" there were 31 pages, you got 35,000. Where were they published?

A. At the Bureau.

Q. Do you know the cost of that?

A. One and a half cents each.

Q. Then there was "Ten Minute Talks," 64 pages, 30,000. Where was that printed?

A. At the Bureau.

Q. Do you know the cost of them?

A. Two and a half cents each.

Q. These were printed at the Bureau I understand, not through the Bureau from some other source?

A. I think they were printed at the Bureau. I can't speak absolutely, but that is my impression.

Q. Then you have a Russian pamphlet, where was that printed?

A. It was printed in New York.

Q. Do you know what that cost?

A. Four and one-sixth cents.

*By Mr. Rosamond:*

Q. Have you a copy of that?

A. Yes. Here it is. It cost  $4\frac{1}{6}$  cents.

*By Mr. Sproule:*

Q. Then you have "Farm Scenes"? You got how many of these. Where were they got?

A. From Toronto. *Saturday Night*, I think. They cost 10 cents a pair, showing early life in Canada and life in Canada on the farm sixty years afterwards.



*By Mr. Wilson:*

Q. These are not what you show in the lantern slides?

A. No. There has been a great demand for these, you will find them in almost every farmhouse, I think, in Canada and the United States where the distribution has taken place. They represent the young man and his wife going off sixty ago to see how they can do in the log house in the woods, and they have in the second picture reaped the efforts of their labour and come back to us in this shape.

*By Mr. Sproule:*

Q. I understand Mr. Pedley to say these cost 10 cents a pair, you paid \$37,670?

A. \$37,670.? That is not right.

Q. No, it would be \$376.

A. About that in round numbers.

Q. How were they distributed?

A. They were shipped to the Head Office and were distributed with the rest of the literature. We send our literature in parcels, which will average about four pounds each. When an application comes in for literature we will send at least two or three pamphlets and a pair of the pictures. We send them to the agent in Detroit in bulk and they are distributed from his office to the other agents in the United States. There is no exception made to the general distribution of these pictures in our literature.

Q. What I wanted to find out was, whether they were principally distributed in Europe or in Canada and the United States.

A. I have not any reason to believe that there has been any special distribution made of them.

*By Mr. Guillet:*

Q. I would like to ask Mr. Smart, in reference to this new atlas, the new edition, I understand there was a new edition showing the Canadian boundary.

MR. SMART—Yes, we got out altogether 200,000 of this atlas and of the later edition. We got out 100,000 of the first edition and 100,000 of the second edition, and in the latter edition we marked the two contentions without having any foot note, but that did not affect Rand McNally's general atlas.

Q. How much did it cost for having the change made?

A. We just got another mark put on showing the contention of Canada. It did not cost anything.

*By Mr. Calvert:*

Q. There was one line on the first and two lines on the second edition?

A. Exactly.

*By Mr. Davin:*

Q. Mr. Smart, are you going to issue any more of them?

A. We are issuing some of them now.

Q. From the same firm?

A. From the same firm.

Q. Have you asked a Canadian firm what they would issue a half million of these maps for?

A. Of the atlases?

Q. Of the atlas?

A. No—well, when the publication of these maps were suggested a few months ago, I asked one publisher about it, and I think we asked a number of other printers about what they thought it was worth, and we got a fair idea in that way, but their prices were three or four times as much as we got these for.

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Q. You have had a great deal of experience in ordering printing ?

A. Yes.

Q. You are aware of this, that if you are giving an order for a large quantity, that after you have had a certain number printed the cost of what follows is very small ?

A. It is only the matter of the paper practically.

Q. Therefore, if a Canadian publisher had the prospect of having 500,000 printed, after the first cost of getting the map, he would have been able to turn out the remainder just as cheap as the United States publisher ?

A. I do not know whether he would or not, I am not satisfied he would.

Mr. PEDLEY's examination resumed.

*By Mr. Sproule :*

Q. Can you give us now collectively the cost of all this literature ?

A. I am rather inclined to think I have not got that totalled up. No, I have it in the lump sum, generally, as I read it to-day, but I haven't it in detail, but that can be obtained of course.

*By Mr. Davin :*

Q. I suppose it is the aggregate of these items ?

A. Which items ?

Q. All the items you have given us.

A. I do not know about that.

*By Mr. Sproule :*

Q. You gave us the cost of these pamphlets and the number of them ?

A. Yes.

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
FRIDAY, May 11, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.45 o'clock a.m., Mr. McMillan, Chairman, presiding.

Mr. FRANK PEDLEY, Superintendent of Immigration, was present at the request of the Committee, and was examined as follows:—

*By Mr. Clancy :*

Q. What is the scope of your duties, Mr. Pedley ?

A. I am placed in charge of the immigration work. All matters of correspondence coming to the Head Office from either Canada, United States, or from Europe, are referred to me, and I have to deal with them from the departmental standpoint. I am also charged with the inspection of the agencies under our control. So far, I have made one or two trips each year in Canada and the United States. I have not been over to the Old Country as yet this year, and am not sure when I will be there.

Q. You are charged with the inspection of all the agencies in Canada and the United States ?

A. Yes.

## ALLOWANCE TO AGENTS FOR EXPENSES.

Q. Did you visit the United States during the last year?

A. I visited the United States in the fall of 1899.

Q. Visited each agency?

A. There were one or two where I did not visit the agency, but I saw the agent. I sometimes, if my time is limited, make connection with the agent at some central point, but generally I visit the agency.

Q. What agencies did you visit?

A. I visited the agency at St. Paul.

Q. Who is the Canadian agent at St. Paul?

A. Benjamin Davies. I visited the agency at Omaha under the charge of Mr. Bennett, the agency at Des Moines under the charge of Mr. Bartholomew—Mr. Bartholomew is not under salary, he is under commission, but has an expense allowance of \$50 a month.—I visited the agency at Chicago under Mr. Broughton, the agency at Stevens Point, Wisconsin, under Mr. Currie, the agency at Detroit under Mr. McInnes.

Q. Now we will take the case of Mr. Currie: Is his family living there?

A. Mr. Currie's family, no, not that I am aware of.

Q. What are the arrangements with all the Canadian agents in the United States with regard to living expenses?

A. Where a man is living at home, if his headquarters are his home, he is not allowed living expenses when there.

Q. Well, take the case of Mr. Currie—do you know whether his family is there or not?

A. I am satisfied they are not unless they have removed there during the last few months, in fact I know they are not.

*By Mr. Wilson:*

Q. If his family were there?

A. He would be domiciled there and get no expenses.

Q. If his family were not there?

A. If his family were not there, then the Department pays his expenses.

*By Mr. Clancy:*

Q. Then do you state that where a man's family resides with him at the agency that he does not receive anything above his salary while he remains at home?

A. Yes, that is the case.

Q. But where his family does not reside there, is he paid living expenses?

A. Paid living expenses.

Q. Well, how do you account for making the difference?

A. Well, the man is supposed to be travelling all the time or nearly all the time, and if he were settled down in the place it would not be fair for him to charge up his household expenses as living expenses. His own expenses are not separable from those of his family in any way. For instance, when I am travelling I am allowed travelling and living expenses; but I am a resident of Ottawa and no expenses are allowed me when I am at home.

Q. Do the agents report to you?

A. Report to me, yes.

Q. Now, can you produce at the next meeting Mr. Currie's report of the number of days he travelled?

A. I can produce his accounts, his monthly accounts which are rendered.

Q. No, I mean the number of days he has travelled?

A. I think so; I think the information should be in the Department.

Q. Will you be good enough to give the number of days' travel by each of our agents in the United States?

A. Information showing the number of days travelled by each of the agents in the United States.



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Q. Yes, that is during the fiscal year, because we have not the accounts covering the calendar year, the last part of it, the fiscal year 1898 and 1899.

A. Yes.

Q. And the number of those who have their families residing with them?

A. That is, the number of agents whose families reside with them?

Q. Yes; also the number of immigrants sent as far as they have account of them, from each of those agencies?

A. Number of immigrants sent from each agency.

Q. Yes, the number located, and where, in Canada, of the immigrants?

A. Number of immigrants located in Canada and where?

Q. From the United States?

A. Yes.

Q. Now, can you give us the agreement entered into with the Doukhobors. I understand there was an agreement entered into?

A. There was a communication from the Department to the gentleman who made the preliminary arrangement as to the Doukhobors. I suppose it would be in the nature of an agreement in one sense, but it is not a contract sealed by the Department. It is a departmental letter.

Q. But that formed the agreement?

A. That is the basis of the arrangement; the departmental letter to the representatives of the Doukhobors stating the conditions upon which the action of the Department regarding the Doukhobors would be taken.

Q. Was there a letter or letters in response to that?

A. I am not prepared to say that there is a letter formally acknowledging and accepting the terms of the departmental letter. Neither am I prepared to say that there is a letter modifying the terms of that letter. All that I know is that after that letter was sent, the Doukhobors came to the country, and as far as I know in the settlement that has taken place since, in a reasonable way, the conditions set forth in the departmental letter were observed.

Q. Was there a letter from their representatives making certain propositions to the Department?

A. I am not certain. My impression is that the Doukhobors met the officers of the Department and discussed the matter.

Q. In the first instance, however, your departmental letter was sent?

A. I am inclined to think now that the history of the Doukhobor case is that information was received by the Department that the Doukhobors were thinking of leaving Russia.

Q. From whom did you receive that information?

A. From the High Commissioner. I think the correspondence was initiated through his office.

Q. Have you that correspondence in the Department?

A. Yes, it is there, and as a result of that correspondence four representatives came to the Department—Prince Hilkoff, Aylmer Maude, and two of the Doukhobors themselves, they had some interviews I think with the Deputy Minister, and with the Minister, and went to the North-west, made an inspection, and came back and then had some further interviews with the Minister and Deputy Minister. I think I was present myself at some of the interviews.

Q. To put it shortly Mr. Pedley, will you give the Committee in whatever form you have it, the arrangement under which the Doukhobors came to settle in Canada?

A. Give it now, Sir.

Q. No, later on. I am not going to ask it now.

A. The arrangement under which the Doukhobors came to and settled in Canada.

Q. Now, you can give the Committee at the next meeting also the number of emigrants sent from the United Kingdom by our agents.

A. Number of emigrants sent.

The CHAIRMAN—When you mention the next meeting, it will be the meeting at which Mr. Pedley gives his evidence, because Mr. Preston will be here at the next meeting.

Mr. CLANCY—Mr. Preston has another part of it and Mr. Pedley has charge in this country and is looking after this end of it.

The CHAIRMAN—What I mean is this. It will be well to have all the evidence and Mr. Pedley will give it when he next comes before the Committee, but he may not be before us at the next meeting.

*By Mr. Clancy :*

Q. Oh well, that is all right.

A. The number of emigrants from the United Kingdom by each agent for the year 1899.

Q. For the year 1899?

A. Yes.

Q. And where these have been located in Canada?

A. And where these have been located in Canada, yes.

Q. I want all those who are adults both from the United States and the United Kingdom?

A. Let me understand you.

Q. In all the reports they count every person who is a male above twelve years as an adult.

A. That is the limit fixed by the steamship company, all over twelve years of age are adults from a steamship standpoint, and between five and twelve they have a reduced rate.

*By Mr. Calvert :*

Q. Half rate?

A. A lower rate, and probably a half rate. Under that they go free.

*By Mr. Clancy :*

Q. In all the reports they count every male person above twelve years as an adult.

A. That is the limit fixed by the steamship companies. All over twelve years of age are adults from a steamship standpoint. Between five and twelve years of age they have a half rate or a lower rate, probably one-half, and under five come in at a varying nominal rate so that is the classification.

Q. I am not talking now of steamship classification. I am talking of the reports of the agents who declare in their reports that so many adults come to Canada.

A. That is, the agents at ocean ports.

Q. It is the duty of our agents to revise whatever may be the regulation of the steamship companies for the purpose of passages having regard to the settlers, namely, not to class persons who are mere children, as men.

A. Yes, you want me to give the number of immigrants from all countries over eighteen years of age, is that it?

Q. Male persons, that is in connection with those located.

A. The number of persons sent out from the United Kingdom since 1898.

*By Mr. Calvert :*

Q. And the females also?

A. That will be the number of males and females over eighteen, you say this is to be given in connection with those located.

*By Mr. McNeill :*

Q. Put in the word "located."

A. Located from all countries, is that it?

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*By Mr. Clancy :*

Q. If we have the number located, they must be over eighteen ?

A. If they were located technically, that is, take homesteads, they must be over eighteen, but if located in a general sense that is a different thing.

Q. Let us make a distinction. Those who may be located on homesteads and those who may be located as constituting a whole family. The homestead might constitute one location but the family might include a dozen ?

No answer.

## IMMIGRATION AGENTS IN FRANCE.

*By Mr. Wilson :*

Q. I would like to ask what knowledge you have of the work that is being done by the agent in the City of Paris ?

A. Which agent do you mean ?

Q. The one in Paris ?

A. We have three there, in a sense.

Q. This is Mr. Bedard.

A. The knowledge we have of his work is that he has visited quite a number of persons out of Paris leading up to the frontier. He has visited families and corresponded with a great number and has come out to Canada once a year to bring out these families with him and settle them in the province of Quebec.

Q. Have you done anything to amount to anything ?

A. He claims to have settled between 200 and 300 people a year.

Q. He does ? Well, you don't seem to have credited him with it ?

A. Of course the number of people,—we have not distinguished Mr. Bodard's work from that of the other agents in so far as the number of settlers is concerned. You will find in my report that something over 400 French and Belgians have come to this country.

Q. But how many of them have been located ?

A. That of course is another question entirely. They have come to this country as declared settlers. He claims he has sent out between two and three hundred people.

Q. He does not in his report, does he ? He says : " During the past two years, the French and Belgian emigration has not been so great as from 1891 to 1896, but it is due to the fact that French settlers, established in Canada and doing well, do not, as a rule, write to their friends in Europe to invite them to come."

A. Yes.

Q. I see you have credited together the French and Belgians as 417 ?

A. 417.

Q. That is all told ?

A. Mr. Bodard, in his reports to the High Commissioner, which were transmitted here, claims to have sent out between two and three hundred French people.

Q. I think those that you have settled on the lands don't amount to very much ?

A. That would be the homestead report ?

Q. Yes.

A. That would only apply to Manitoba and the West.

Q. That is the only ones that you encourage, is it not ?

A. Oh, no, you will find in my report, or not in my report but in my statement before the Committee the other day I stated that about 900 people had been brought in from the United States by the Quebec and Lake St. John Railway Company and settled in the neighbourhood of Lake St. John, and somewhere about 900 people by the Repatriation society in the Province of Quebec up near Lake Temiscamingue.

Q. The only people who would get any bonus were for those who were settled in Manitoba and the West ?

A. They report at Winnipeg before the bonus is paid ?



Q. There are very few here—French 53 ; Belgians 56 ?

A. That is at Winnipeg.

Q. Where located ; and I suppose his special business is to send them to these places ?

A. No, he was working under an arrangement, a tacit arrangement that was made some years ago, that he would endeavour to attract the emigrants from France and the Belgian frontier to some of the newer districts in the Province of Quebec, and if a number of families, at least if the greater part of the number of families he has sent out have been sent to the Province of Quebec, which he claims to have done to a large extent, they will not appear in the record of bonused people because they do not go to Winnipeg.

*By Mr. McNeill :*

Q. With regard to this there are three emigration agents are there, in France ?

A. In Paris.

Q. There are three emigration agents you say in Paris ?

A. Yes, we have three.

Q. Have you any others in France except those in Paris ?

A. No, Paris is their headquarters and they work out from there.

Q. And there have been 415 emigrants come here ?

A. Yes.

Q. How many does this agent say were sent ?

A. Well, I am only speaking from memory of his report to the High Commissioner, but he claims to have sent about 200. There is one gentleman there who is paid—when I speak of him as one of our men, it is because the Department has for years contributed a small sum of money for the publication of a small journal in Paris, paid to Mr. Hector Fabre who has been there many years.

*By Mr. Wilson :*

Q. There is no reason why that should be there at our cost if no good ?

A. I quite agree with you.

*By Mr. McNeill :*

Q. What is the amount we pay for immigration services in France ?

A. Somewhere in the neighbourhood all told, salaries and expenses, between \$4,000 and \$5,000 a year, that is including that special grant which I do not put down as being of use, altogether from an immigration standpoint but which has been paid for years in Mr. Fabre's case.

Q. These are 415 individuals you mention ?

A. They are classified as souls.

Q. Could you tell me, Mr. Pedley, referring to a reply you made to me last time, whether there is any means whereby we could arrive at a satisfactory conclusion as to the numbers of people from the States who have actually become residents and homesteaders in Canada ?

A. Well, we might possibly be able to form an idea, approximately, by a very careful investigation in different parts of Manitoba and North West by our agents as to the persons who have settled there in the last year, and by getting from the railway companies and other companies who have land to dispose of the names and origins of the purchasers. That, you see, involves a large amount of work.

Q. It would obtain a large amount of valuable information for the Committee and the country ?

A. A large amount of light will be thrown on that very matter when the census is taken, as I understand the census papers contain a column for the place of origin.

## APPENDIX No. 1

*By Mr. Wilson :*

Q. Why could that not be in your report from year to year ?

A. Which ?

Q. The number and locations of all these people ?

A. Well, one reason why, is that it would involve a great deal of expense, and the amount of money at our disposal we think would be better employed in other ways.

Q. How do you arrive at the reports you do make ; you don't seem to consider them very reliable ?

A. From information obtained from our officers to whom these people report. The information obtained at the seaports is, of course, absolutely accurate unless the whole system of record is false.

Q. I am speaking of those now who are homesteaders ?

A. Well, the homestead entry will show the place of origin.

Q. But have you any means of accurate information, and is not that reliable as to the whole number settled on the land ?

A. Well, there were 6,689 homestead entries this year. If you turn up each individual entry, you will get the place of origin of the homesteader.

Q. Will that show whether he came out under the auspices of the agent or simply on his own account ?

A. There is the point where the difficulty occurs. As I said in an earlier stage of my examination, the work done by an agent this year may not fructify for a year, and whether he is the result of the immigration of this year or last year or the year before, would be problematical. The only way you could get at that would be by the introduction of the passport system by which you could follow a man up from the time he came into the country.

*By Mr. McNeill :*

Q. Are there voter's lists for the North West Territories ?

A. I fancy so, but I am not very familiar with the way they are made up. There are very few municipal organizations where reliable figures are made up like those we have in the east.

*By Mr. Burnett :*

Q. I don't think there are any voter's lists in the North West Territories ?

A. I am not sure.

*By Mr. McNeill :*

Q. There would be no difficulty in Manitoba ?

A. It would be much easier in Manitoba because the system there is more definite.

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
TUESDAY, 23rd May, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock a.m.; Mr. McMillan, Chairman, presiding.

The CHAIRMAN.—Mr. Preston was here last Friday, but there was not a quorum of the Committee present, and he told me he could not be here to-day and probably would not be able to come before us again this session. However, he said he would leave the questions he had been asked with Mr. Pedley for him to answer.

63 VICTORIA, A. 1900

Mr. FRANK PEDLEY, Superintendent of Immigration, was present at the request of the Committee, and continued his statement as follows:—

The first question that was given to me by Mr. Clancy the last time I was before the Committee was respecting information:—

*By Mr. Sproule :*

Q. Would it not be well to answer Mr. Preston's questions first ?

A. I have not got these with me.

Q. It is not fair to the Committee that Mr. Preston should go away and that we should not have these answers ?

A. I think the understanding was that he would let me have the questions and I would furnish the answers to the Committee. He has the evidence containing them with him.

#### LIST OF AGENTS AND THEIR WORK IN THE UNITED STATES.

Q. He gave you no answers at all ?

A. No.

The first question for which I was to obtain an answer was that showing the number of days travelled by each of the agents in the United States during the fiscal year 1898-9. Benjamin Davies, St. Paul, 153 days travel and 123 days in the office. James Grieve, who is now at Saginaw, Michigan, but was I think part of the fiscal year at Reed City, Michigan and the balance of the year at Mount Pleasant, Michigan, and within the last few months has been moved to Saginaw, travelled in that year 232 days and was in the office 56 days. E. T. Holmes, who was sent to work in conjunction with Mr. Davies at St. Paul in the State of Minnesota.

*By Mr. Wilson :*

Q. Is he any relation of the member ?

A. I think he is a brother, I do not know of course—travelled 136 days, in the office 68 days. That would probably include part of the Monday at the beginning and Saturday at the end. They start out towards the beginning of the week usually and get back about the last of it. Mr. Holmes was appointed with the view of doing the greater part of the travel in the State; Mr. Davies having to do a great deal of office work, could not do both. St. Paul is a distributing point where a great deal of office work is required. C. J. Broughton, the agent for the State of Illinois, whose headquarters are at Chicago, travelled 228 days, in office 82 days. T. O. Currie, when he was first appointed, was working in Minnesota, but I think the whole of the fiscal year that I am reporting on now Mr. Currie was in charge of the State of Wisconsin, with headquarters at Steven's Point.

*By Mr. Clancy :*

Q. Well, are you sure about that, it is important to be sure about that ?

A. Yes, I am sure for that fiscal year, yes. He travelled 157 days; was in the office 121 days, but he was sent to Omaha to act in conjunction with our agent for the State of Nebraska at the Trans-Mississippi Exhibition, which was held in Omaha for about six months, ending October 31, 1898.

Q. How many days was he engaged there ?

A. I have not the number of days. I think he was there six weeks or two months.

Q. Are these included as office days or travelling days ?

A. I am inclined to think as office days, because he was not travelling. He would only go out on the invitation of the Canadian agent. He would be largely in Omaha looking after the Canadian exhibit.



## APPENDIX No. 1

Q. Can you be sure which class that is to be counted in?

A. I am not quite sure whether his report makes that distinction, but I am strongly of opinion from reading the report that he travelled 157 days in the State of Wisconsin, and that the 121 days would include the time in Omaha. W.V. Bennett who is in charge of the State of Nebraska, with headquarters at Omaha, travelled 140 days, in office 148 days, which would include the time he spent in his office in Omaha that summer at the time of the Trans-Mississippi Exhibition. M.V. McInnes, the agent at Detroit, travelled 105 days, in office 99 days. The Detroit office is the office from which we ship all our literature, and a good deal more office work is required there than in some of the small outlying places. D. L. Caven, who, during the fiscal year was stationed at Bad Axe in Michigan, travelled 266 days, and was in the office 34 days. These are the reports I have in answer to that question.

*By Mr. Cochrane :*

Q. What are we to understand by an agent travelling—what is he doing when he is travelling—what is his object in travelling?

A. To answer that question clearly, I will assume in the first place, which, after all, is a matter of fact, that the agent is the recipient of a great many enquiries from persons who desire information about Canada as a field for settlement. He then travels to see these parties, for the purpose of giving them information and of persuading them to move to Canada. When he once gets his system thoroughly inaugurated in his State, his correspondence develops considerably, which necessitates a great deal of travelling, and in the course of the year he arranges for a series of meetings, either for the purpose of delivering lectures or convening the people in order to discuss Canada as a field for settlement. There are a hundred and one things that the agent has to do. He is brought into contact with the people, and he finds that it is greatly beneficial to his work to travel out in the country districts and to go as far as to canvass personally these people, to induce them to move to Canada.

Q. Are we to understand that when a party who wants information writes to these agents that they will travel out to give it to them personally?

A. I do not say that they travel in order to see personally every one who writes them. They generally send them the literature furnished by the Department, but the agent has to be a judge of the circumstances for himself as to whether it is necessary for him to travel and see them.

*By Mr. Clancy :*

Q. How long has Mr. Davies been located in St. Paul?

A. Ever since his appointment, which, I think, was some time in '97 or probably in the fall of '96. I took office in the fall of '97, and he was appointed before my time.

Q. You have given us his travelling days and the number of days he was in the office. Where was he the balance of the days during the year?

A. That makes a total of 276 days. There would be about 300 working days in the year, leaving out Sundays and holidays, and he would have probably a couple of weeks vacation; we generally give them a week or ten days at Christmas if they ask for it.

Q. There are 24 days, which is pretty nearly a month; did he have a vacation?

A. Yes. I can't tell you exactly when the dates were. But nearly every one of them has had a vacation. He seems to have reported pretty fully for the whole year.

Q. Can you tell us what part of the year he had vacation in?

A. I can by looking at the record.

Q. Well, give us that the next time. Does Mr. Davies' family reside in St. Paul?

A. Yes, I think the answer to the next question will answer that.

Q. Now Mr. Grieve? Oh well, we will pass over Mr. Grieve, and take Mr. Holmes. When was Mr. Holmes appointed?

A. In the summer or spring of 1898.

Q. Then he was there during the whole fiscal year of '98 and '99?

A. Yes.

Q. Now you have him travelling 136 days and 6 days in the office, making 204 days altogether.

A. Yes. Well, then there were—

Q. Where was he during the balance of the time?

A. He was engaged in work, but he has not sent in his report for that part of the time, that would be required to make up the number of ordinary working days in the year.

Q. How do you know he was at work, since you have not a report?

A. Well, they send in a double report. His account, which is a statement of expenses shows where he is; then they send in a weekly report, that is, generally speaking, they send in a weekly report. Sometimes they miss this, either they may be at the State Fair or they may be at some place for a week or two and might not send in a report for that period, but I have endeavoured to get them to send in their reports.

Q. Do you know whether Mr. Holmes sent in a report at all?

A. His accounts will show where he is at that time.

*By Mr. Sproule:*

Q. That is a report of expenses?

A. Yes, a report of his expenses, which is practically the same report, only one is for the Department proper, and the other is for the accountant.

*By Mr. Cochrane:*

Q. In that case you have a report that he wanted his money, but not a report that he did his work?

A. No, we have a report of the expenditure of money by him day by day. There is no trouble about it. I can get these reports, and have them all filled in if the Committee thinks it is necessary.

Q. Let us make it clear. The statement you are making now is as to the number of days travelled by each agent during the fiscal year 1898-9?

A. As reported to us.

Q. Yes, and the number of days he remained in office or otherwise disposed of?

A. Yes.

Q. In the case of Holmes you gave this at 204 days?

Q. Namely, 136 days travelling, and 68 in the office. The balance is entirely unaccounted for so far as you are able to make a statement?

A. Well, I can make a statement if I go over his reports.

Q. How do they get 68 days in the office and 136 days travelling, if you have not the information at hand?

A. This information we have is in his report which has been sent in weekly.

Q. Now, what I have asked is when it was not sent in, how do you get it, in the absence of information? You are unable now to give it.

A. Give what?

Q. The number of days in which he is actually engaged.

A. It is reported to us. He reports this to us.

Q. He reports to you having travelled 136 days, and that he remained in the office 68 days, making a total of 204 days, and leaving a balance of 96 days of which he gives no account?

A. No, no, I do not say that. He has reported.

Q. Where is that report?

A. For instance he did not report for July 23, that is the diaries are missing for these dates. He may have reported, but my own impression is that he has not sent them in; he does not report for August 6, 13 or 20.

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Q. Have you any information as to the 96 days, the balance of the working days of the year, as to where Mr. Holmes was or what he was doing?

A. Yes, we have them in the monthly statements of disbursements.

Q. That is only asking for the money?

A. No, it is a report of every item of expenditure, when and where incurred, the monthly statements of disbursements must show where he is and what he is doing. It is as correct as the statement of work that he sends in weekly. He can give the particulars of the number of days and where he was, I have no doubt, but he has only reported that he was 136 days travelling under the system of diaries we have.

Q. As inspector that comes under your notice?

A. It does.

H. How then is it that you permit a gap of that kind of nearly one-third of the whole year that there is no report of the work done and where he was during that period?

A. Oh, there is a report.

Q. No, there is a report that he travelled here and there, but no report of the work done.

A. The diaries they send in are, say for May 23. "Went to Minneapolis, spent the day there with certain parties, helping them to load their cars to start out for Portal on the Soo line."

Q. Where is that information for the 94 days?

A. If you turn up his statement of disbursements you will find it: "that day was at Minneapolis, spent there so much for hotel, for car fare, or whatever his expenses were."

Q. Let us make it clear—what do you mean? Are you assuming a case?

A. You were asking me what these diaries show.

Q. Where are the diaries?

A. In the office.

Q. Have you a diary covering that 94 days?

A. No, I say these diaries have not been sent in for those days.

Q. All you know is that he sent in his disbursements, stating in his account that he travelled from place to place?

A. Yes.

Q. And made a charge in each case?

A. Yes.

Q. That is all you know in regard to the 94 days?

A. That is the only specific knowledge I have.

Q. Take Mr. T. O. Currie—but, before I leave, does Holmes' family reside there?

A. Yes, he is down in Indianapolis now. His family reside with him, yes.

Q. Take the next, Mr. Pedley, that is Mr. T. O. Currie.

A. Yes.

Q. He travelled 158 days and was in the office 121, making 278 days to account for the balance. He must have had his family with him.

A. From September 17 to November 7 Mr. Currie was at Omaha.

Q. Does that include?

A. That includes the 121 days in the office.

Q. That is 121 days in the office, but I am asking now for the difference between 278 and 300?

A. Yes, that will be about 22 days.

Q. Yes.

A. Well, he was down in Ottawa at the request of the Department at Christmas time—1898–9—and he was allowed a vacation at home when he was down.

Q. For how long?

A. Well, I should say, speaking from memory, he would be absent from his work from fifteen to twenty days, including his official visit to Ottawa.

Q. Was he not travelling during his official visit to Ottawa?



A. He was not travelling in the State of Wisconsin. I will bring over the diaries if you would like to see them.

Q. I do not want to prolong it.

A. There is one week probably not accounted for. He wrote to that effect at the time, owing to the fact, I think, of one leaf of his note-book having been lost.

Q. He had his home where?

A. By his home you mean his domicile. It is out from Strathroy in the County of Middlesex.

Q. Now, does Mr. Broughton's family reside with him?

A. No, he is unmarried; he lives in Hamilton.

Q. Does Mr. Grieve's family reside with him?

A. When Mr. Grieve first took office, his wife and family lived, I think, at his home in the County of Perth. Mr. Grieve's wife died about a year ago or a year and a half, and so in that sense his family is not living with him. He has a couple of children, I think, they may have been over visiting him, but to all intents and purposes, so far as we are concerned, his family is not living with him.

Q. Now Mr. Bennett, does his family reside with him?

A. Yes, they live in Omaha.

Q. Mr. McInnes?

A. Yes.

Q. Where does his family reside with him?

A. In Detroit.

Q. Now, Mr. McInnes travelled 105 days, and was in the office 99 days?

A. That is 204 days. Some of his diaries have not been sent in.

Q. Well, are you unable to give the information with regard to Mr. McInnes of what he was doing the balance of the time?

A. By looking over his monthly statement of disbursements, I can tell you.

Q. You can't give it now?

A. No.

*By Mr. Sproule :*

Q. Have you a statement of expenses for the whole year?

A. They are on file with the Auditor General and the accountant.

Q. He has got his expenses for the whole year?

A. Yes.

Q. There are 112 working days not accounted for taking out the Sundays and 52, making 160 days during which he is not working, and yet he got expenses for the whole year. What is the arrangement with Mr. Davies with regard to living expenses?

A. When he is out from St. Paul travelling on behalf of the Department he is allowed living and travelling expenses. When he is at home, he is not allowed that.

Q. Actual expenses?

A. Actual expenses for travelling and living.

Q. How about Mr. Grieve?

A. He is allowed all his living expenses.

*By Mr. Wilson :*

Q. The whole year round?

A. Unless he is on vacation, but when working for the Department.

Q. That is, because he has no family?

A. Yes, that is, with him.

Q. A man who has no family, you pay all his expenses, and when he has, you do not?

A. Yes, when a man is away from home engaged in the work of the Department, he is paid his living and travelling expenses.

Q. You take it that a single man is always away from home?

A. Beg pardon?

## APPENDIX No. †

Q. You take it that a single man is always away from home according to that?

A. Not necessarily, he may be living with his parents in the place where he is working.

*By Mr. Clancy :*

Q. He has headquarters in which he spends so many days in an office annually. Does that not form his home, for instance I will take Mr. Grieve?

A. He will be allowed his expenses for the whole year.

Q. Well, has he had a letter of instructions of that kind?

A. Yes, the policy of the Department as far as that is concerned has been laid down by letters.

Q. Well, are there letters in existence setting forth that this is to be allowed to Mr. Grieve?

A. Well, I do not know that Mr. Grieve has been specialized, that has been laid down, though, by the records of the Department.

Q. In every case where a man has no family his living and travelling expenses, actual disbursements, are paid during the year?

A. No, that is not it at all. If a man is living with his family in a place where his headquarters are, he is not allowed living expenses when he is at home. If he is not living with his family then his expenses are allowed.

Q. Has that always been the custom?

A. It has been the custom, though I had nothing to do with it.

Q. Have you had instructions to that effect in the inspection of the agencies?

A. Well, I do not know that my instructions have arisen in that respect in regard to inspection of agencies. My instructions have been as far as the passing of the accounts are concerned.

Q. You have instructions of that kind?

A. Yes.

Q. Are they verbal or written?

A. Well, I fancy that the instructions were of a verbal nature, I have discussed this matter with the Deputy Minister and that is the policy of the Department as laid down by him, and he has passed the accounts based on that policy.

*By Mr. Wilson :*

Q. You say Mr. Grieve is allowed his living expenses the year round whether at Saginaw or travelling; now, I would ask why he is made an exception?

A. He is not.

Q. Well, do you do that with all the men who have not families?

A. Well, I cannot answer the question as you put it—without families; it is not a question of not having a family.

Q. Well, what is it?

A. It is a question as to whether a man is living at his domicile.

Q. I mean when a man is at his headquarters, whether his family is there or not, you allow him his expenses when his family is not there? It is a fair question.

A. I am not saying it is not a fair question; I am trying to show the Committee that the policy of the Department is that where a man's family is not living with him, as when his family is in Canada and he is away from them, we will give him so much salary and travelling and living expenses.

Q. For the year?

A. Yes.

Q. But if his family is with him?

A. If he has taken his family over, he does not get his expenses while he is at home.

Q. Well, that is a matter of policy, I suppose?

A. It is the same with me, I do not get expenses when at home here.

*By Mr. Sproule.*

Q. But if he is living and working there it is to all intents and purposes his domicile?

A. I would not like to say that. We have one unmarried man——

*By Mr. Wilson :*

Q. Can you give any reason which satisfies you why a man with no family is allowed living expenses and a man with a family is not? How do you reconcile that?

A. I think myself it is a very reasonable policy; I do not see anything unreasonable in it. You take one away from his family, he is put to extra expense, and deprived of the comforts of home; I think it is only fair that a man should get his expenses in such a case.

*By Mr. Clancy :*

Q. Have any of these men been allowed living expenses during the period of vacation?

A. No, not intentionally anyway.

Q. You are quite sure that has not been the case?

A. Yes, quite sure.

Q. Now I will take the case of Mr. Holmes, who has travelled 136 days and been in the office 68 days. Is Mr. Holmes supposed to have any living expenses during that time?

A. In the office you mean?

Q. Yes, in the period in the office.

A. No, not when his family is there. I am not quite sure when his family went there.

Q. During the period his family was there?

A. During the period his family was living in St. Paul he would not get living expenses.

Q. Are you prepared to say his family was not there during the whole fiscal year of 1898-9?

A. Not off-hand, I don't think his wife and family moved there for some time.

Q. Now take Mr. Currie, would Mr. Currie be entitled to living expenses the year round?

A. Mr. Currie would be entitled to living expenses the year round on the assumption that he is working all the time for the Department. That, of course, does not include the time that he is on vacation.

Q. You visited Mr. Currie's office at Steven's Point?

A. At Steven's Point, I did.

Q. Did you stop at the same hotel?

A. I did.

Q. Is it a very expensive hotel?

A. No.

Q. What are the fares?

A. I think the rate is about \$2 a day.

Q. \$2 a day; what is the name of the hotel?

A. It is, if I remember right, The Arlington.

Q. You say then by the day it is \$2?

A. \$2.

Q. Now Mr. Bennett, has he his family residing with him?

A. He has.

Q. And he is not supposed to have any living expenses during the days he was in the office, namely 148 days?

A. No, is not supposed to have living expenses then. With reference to that you may possibly find that some expenses are charged by Mr. Bennett during the



## APPENDIX No. 1

time he was attending the Exhibition there. They had to be on the ground from early in the morning until about midnight, and if there are any charges made by Mr. Bennett for lunches, or anything of that kind, during the time that he was in charge of the Exhibition they will be allowed upon the ground that he was inconvenienced to a certain extent from going home to his meals and we would consider it a fair charge to allow.

Q. Do you know such charges were made?

A. I do not know only from memory; I have not gone over the accounts for two years.

Q. Next take Mr. McInnes; he was in the office 99 days, I presume he would not be allowed living expenses during the 99 days?

A. No.

Q. He has his family there?

A. Yes.

*By Mr. Wilson :*

Q. You say you allowed him \$80 a month for board?

A. I said the expenses would probably run up to \$80 a month or more, but when we came to check over the accounts then the disbursements became known.

Q. Here is exactly what you say: "As far as my memory serves me, his hotel bill was \$80 per month, and it may be more," that is Mr. McInnes?

A. Yes.

Q. So you do not make any exception here, as to hotel bills or anything, that is for the year I take it?

A. No, the impression I intended to convey to the Committee, as far as that is concerned, I think my words will bear that construction, is that Mr. McInnes will probably spend about \$80 a month for his travelling expenses, as far as my memory serves me, his hotel bill is \$80 per month, it may be more; of course that is only an approximate amount; where the statements of his actual disbursements all on file, I suppose the Committee will take them instead of my estimates, because they are right.

*By Mr. Clancy :*

Q. D. L. Caven, has he his family with him?

A. No, his family lives at Montreal.

Q. He of course was allowed living expenses?

A. Yes.

Q. That seems to conclude that branch of the question, Mr. Pedley. What is the next you have there?

A. The question was the number of agents whose families live in the States with them. They are, Messrs. Davies, Holmes, McInnes, and Bennett.

*By Mr. Taylor :*

Q. What is Mr. Currie's salary?

A. \$100 per month.

Q. And then his board and all expenses outside of that?

A. All expenses outside of that.

Q. Does he get travelling expenses?

A. He does when travelling on behalf of the Department.

Q. And when he is living at headquarters he is paid his board?

A. Yes.

Q. At the hotel Arlington?

A. I am only speaking from memory and I am satisfied that is the hotel.

Q. And the rate is \$2 per day?

A. I think it is. You can turn up the accounts of his disbursements.

Q. I have them here. In July it was \$63. He was here at Ottawa on the 31st December, and back again on the 11th of January, \$54 for December, \$43 for January, \$56 for February, and \$63 for March?

A. Are those disbursements made at Steven's Point or while travelling?

Q. It is hotel, don't say where. Ticket to such a point so much and hotel so much?

A. Oh, that is when he is travelling.

*By Mr. Wilson:*

Q. I understand some of your agents travel on passes and some pay their fare?

A. That is in the United States.

Q. Oh, no, that is in Canada?

A. They all travel on passes here.

Q. And you allow them to insure their lives, all of them?

A. We do, when travelling on passes, as the railway company specially state they will not be responsible for damages for accidents.

*By Mr. Taylor:*

Q. Don't you think that with a salary of \$1,200 a year for Mr. Currie, he could afford to pay his own board? Don't you think that is a good salary for him?

A. There are some men who draw a higher salary than he does and get their expenses.

Q. Is not \$1,200 a good salary for a man of Mr. Currie's ability?

A. I do not know that I can express an opinion on that. He has ability, and the Department thinks he is worth that amount, we have no reason to complaint of his work. He was considered to be so good a man that we sent him down to Omaha in 1898, to take charge in conjunction with Mr. Bennett at the Omaha Exposition, where the Government was represented by a very fine exhibit.

Q. You say he was 121 days at headquarters?

A. I did not say that. He was 136 days travelling and 121 days in the office.

Q. For a permanent boarder at headquarters is not \$2 per day a big price for an agent to pay for his board?

A. He is not a permanent boarder in the fullest sense of the term.

Q. He pays his rent there all the time?

A. He may be in the hotel for two days in a week and he may be out five days; so that he is coming and going all the time. He is not a man who is boarding by the month. He is boarding by the day, he may be away from the hotel for two or three weeks at a time.

Q. Is \$2 the regular charge at that hotel where he stops?

A. I fancy it is.

Q. Mr. Currie—was he the Patron candidate in the last general election somewhere?

A. I do not know whether he was one of the candidates or not.

Q. He was nominated and then refused to run—was not that it?

A. I do not know that.

*By Mr. Sproule:*

Q. You have not given us all but only a portion of the agents in the United States?

A. There are two who have not reported yet.

Q. There are 2, 3, 4, 5, 6, 7 and 8?

A. Yes.

*By Mr. Clancy:*

Q. Who are the two who have not reported?

A. Mr. Crawford and Mr. Rogers.

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Q. Have they not reported during the year?

A. They have reported by correspondence, but they have not sent in their diaries in regular form, and I am not able to make a computation of the number of days travelled, but I have a statement of their disbursements.

Q. They seem to come in with great regularity, I mean the accounts for expenses.

A. They cannot get their money until they put them in.

Q. How often are these reports to be sent to you, the record of the work done?

A. They should be sent to me weekly.

Q. Have you ever called Mr. Rogers' attention to that?

A. I have, and I have called Mr. Crawford's attention to it, too.

Q. Yes, and what has been the response?

A. Mr. Crawford takes the ground that it would be impossible for him in the nature of the work he is doing to give us a satisfactory report of each day's work. He has a style of his own in conducting immigration propaganda, and he does not report, weekly.

Q. Now you say that Mr. Crawford has a style of his own, and that he tells you it is impossible——

A. Well, I do not know that he says it is impossible.

Q. Are you the inspector of his work?

A. Yes, I have gone over his work pretty fully.

Q. Do you agree with the contention he makes?

A. I am not prepared to say I agree entirely that he is not able to make a full report to the Department. Of course he sends in his monthly statement of disbursements, and we know what he is doing.

*By Mr. Sproule :*

Q. Does he get his salary with the disbursements?

A. Oh, yes, he gets his salary.

*By Mr. Clancy :*

Q. Do you propose to allow Mr. Crawford to refuse to give you reports?

A. Well, I would prefer that he sent them in.

Q. That is not the question, Mr. Pedley. Do you propose to permit him to continue in his refusal to give you his reports of the work done?

A. Mr. Crawford has not refused to give me reports, he does report to the Department. He reports to the Department continually by correspondence, and puts in his statements of disbursements, but he has not reported. I do not know whether he misunderstands the instructions of the Department or not, but he has not reported in that diary form that we would like him to.

Q. Have you requested him to report as other agents are doing?

A. I do not know that I have, simply because that would not afford me very much light, as he is not brought into contact very much with the other agents, and does not probably know what their instructions are. He may think he is conforming to his instructions by sending in his letters as he does.

Q. It would seem that you have not disabused his mind, if he is under the impression that he is conforming with the requirements.

A. I have endeavoured from time to time in my correspondence with him to get him to particularize a little more fully as to his work, and I think he is improving.

Q. Mr. Crawford, when did he go over?

A. I think he is a man who has been in the employ of the Government for a good many years.

*By Mr. Roche :*

Q. Where is his residence?

A. In Manitoba, I think.



Q. Do you know if he occupies any other position?

A. No.

Q. He is registrar in the town of Birtle under the Provincial Government of Manitoba. He is registrar in Manitoba now.

A. Yes? I do not know that of course.

*By Mr. Clancy:*

Q. Did you visit his base of operations?

A. No, his headquarters are in Kansas City. I have met him at Winnipeg, St. Paul, and Omaha, and discussed matters with him. But he has a good deal of travelling, he just has a room in Kansas City where he conducts his correspondence. He goes into the country to towns and villiages and holds open air meetings.

Q. You do not know if the statement be true that he is registrar at Birtle or whether he has been at his office at Birtle or travelling in the interests of the Immigration department.

A. Oh, yes, I know every time he comes to Canada, I know when he comes.

Q. How do you know?

A. Because he writes to the Department and says so.

Q. Have you any other evidence than that he has merely written?

A. No, I have no evidence that he is there either adversely or in his favour.

Q. It is possible if he was so disposed that might not be true.

A. It is quite possible that any of these agents might make up statements that are false.

Q. I am dealing with a case that is exceptional because he has refused or neglected to give the information.

A. I did not say he has refused or neglected to give us information. He has sent us information from time to time, that he may have considered is sufficient.

Q. Who is the judge of that as to whether it is sufficient?

A. I am the judge of that.

Q. That is the judge, if you had satisfactory information.

A. In answer to that question I think I am safe in saying his answers might have been in better form.

*By Mr. Davin:*

Q. Do you mean that they are not satisfactory?

A. Satisfactory is a very comprehensive term. They are not satisfactory completely.

Q. Do you mean they are from your point of view not adequate?

A. No, I think that the information that we received from Mr. Crawford is thoroughly adequate as to his immigrants.

Q. Then it must be satisfactory?

A. But a man's action may not be satisfactory in the sense that it is not in strict compliance with the instructions of the Department.

*By Mr. Clancy:*

Q. Did you ever call his attention to the instructions from the Department?

A. Oh, yes, time and again.

Q. By letter?

A. By letter as to what the Department wanted.

Q. Did he reply to these letters on that point?

A. I think he has replied to suggestions of which I told you that he did not know that he was in a position to write down in the form the Department wanted his answers, but he would write from time to time showing what he was doing.

Q. You have these letters in your department?

A. Yes.

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Q. Will you bring them the next time to the Committee, also a copy of the letters of instruction to the agents generally?

No answer.

*By Mr. Taylor :*

Q. I see that Mr. Currie's expenses for the last fiscal year were \$1,523.97 and his salary \$1,200, making a total expense of \$2,723.97. Can you give us any statement of the return in value for that money of immigrants he secured?

A. I gave a statement here somewhere if I can just put my hand on it.

Q. Never mind it now, it will come up later on?

A. I think he claims to have sent somewhere in the neighbourhood of 200 people from the State of Wisconsin. Yes, here we are, 284 people.

*By Mr. Cochrane :*

Q. Has he got any local agents under him who are paid a bonus?

A. Yes, I read the other day to the Committee the number of local agents in the State of Wisconsin. He has some under him, Mr. Cochrane, if I could just turn up that phase of the work, I will let you know. Here we are, Wisconsin 26.

Q. How many now in connection with that did they get paid for per head?

A. I have not that statement here; at the request of the Committee I handed in a statement showing the total amounts paid to the commission agents in the United States. I cannot say how much of that is paid commission agents in Wisconsin.

Q. Would that not be direct information on the lines I was drawing to your attention the other day?

A. Yes.

Q. If you take that one case and find how many of these local agents were paid for sending these 200 men into Canada it will give you an idea of what these men are costing. I am not finding fault at all with it, but it struck me that there was a chance there of emigrants costing the country more than they should have. For instance this gentleman is paid liberally anyway for doing his work. He travels a great many miles, and the country is paying for it. I do not object to that, but it appears to me that these men perhaps are doing the work and local men perhaps are getting paid for the work these men did. The information they were giving would induce settlers to come to Canada and now you have 20 local men that I dare say get paid five dollars per head for every man that came from that State to Canada, even if his coming was the result of our agent?

A. Of course there is the further difficulty which has presented itself which I have discussed somewhat in detail throughout these meetings. But if Currie has sent the 284 people himself no commission will be paid on them.

*By Mr. Clancy :*

Q. Is there any commission paid in the State of Wisconsin?

A. Oh, I think so, I am satisfied there is. It is only a case of looking up the record. We have a record of every cent we spend in that way.

*By Mr. Cochrane :*

Q. There is the difficulty to my mind that he is there as an agent and he is travelling, which I think he should to a certain extent, to give lectures and give information not only by lectures, but by correspondence. Currie claims he has sent 284 men and there are these 26 commission men there, and the question presents itself to my mind that the local agents get credit for these men, and the country is paying twice. As I see it, Mr. Currie—I am not finding any fault, I want that distinctly understood—Mr. Currie says to the ratepayers of Canada, "I am sending 200 men here for the amount of money I am receiving," \$2,700 or whatever it is—of course we are getting the value of it, because when we ask Mr. Currie what the

value is he says he has sent 200 men, but we have local agents there and probably they have received \$5 each for these men.

A. It is fair to state that the question of salary and expense of United States agents has been for years a considerable item, and has been under discussion. On looking over the records I see the Committee has been anxious from year to year to find out the results from this work and whether they justified the amount which was being expended. In the year 1893 the salaries of United States agents were \$20,626.51, and expenses, \$16,075.18, and allowance, \$15,327.52; over \$50,000 was spent in salaries and expenses for the work in the United States in 1893. We have in this list here forty-eight salaried agents in the United States in 1893.

*By Mr. Sproule :*

Q. How many immigrants were reported as coming in in that year from the United States ?

A. If you have the annual report there for 1894 it will show that.

*By Mr. Clancy :*

Q. I am afraid we are getting off the real question. Mr. Currie reports having sent in 284 people. Now this is what Mr. Currie says in his report:—"Through hard work and close application to business there have been sent from this state 284 people, one family going to southern Ontario, 32 going to Rainy River district in northern Ontario," that is from the whole of Wisconsin. Now, have you an agent at Rainy River ?

A. Well, Mr. Burriss works part of that Rainy River section.

Q. Does Mr. Burriss report having received that 32 families ?

A. I do not know that his report specifies that. You will find he reports having received 227 people.

Q. That would be about nine to the family; these are large families ?

A. Well, of course, if these are all the families——

Q. No, this man reports 33 families, one went to southern Ontario, and the other 32 went to the Rainy River district; have you any evidence that these ever landed in Canada ?

A. We have the evidence that over 200 people—227 people——

Q. No, but have you any evidence that the 32 families specifically stated by Mr. Currie as going to the Rainy River district ever went there ?

A. I cannot say we have any evidence that 32 families came in as 32 families and passed the Canadian customs as 32 families.

Q. He says 32 families.

A. He says 284 souls.

Q. No, he says: "Through hard work and close application to business there have been sent from this state 284 people, one family going to southern Ontario, 32 going to the Rainy River district in northern Ontario." It is perfectly plain.

A. Perfectly plain, but he does not say, though, that the thirty-two families comprise all the 284 people.

Q. He says that so many families went.

A. He says thirty-two went to the Rainy River district.

Q. Have you any evidence that 284 people came from the State of Wisconsin ?

A. Well, I do not know that our records will show that exactly——

Q. Nor have you any ——

A. —— that is to say, there is no doubt that if we went to the expense and trouble we might possibly trace those people that came from Wisconsin that are in the North West, but I am a little doubtful if our present records will show that.

Q. Can you say how many landed at Winnipeg ?

A. How many immigrants ?

Q. As coming from our agents in the United States ?

A. That was one of the questions asked me the other day and I have gone into the matter to see if I could get an answer and find it is practically impossible.



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Q. You cannot answer it ?

A. It is something the United States tried to do some years ago ; they tried to keep tab on everybody coming in and they had to give it up.

*By Mr. Cochrane :*

Q. You have no positive proof anybody comes in ?

A. We have no positive proof in any shape or form that any man comes in unless he is in our custody or under our personal supervision. Under any system where you leave a man liberty of action, he can get up and leave the country if he wants.

*By Mr. Sproule :*

Q. I suppose these people would come in as settlers and with effects, and the customs must have some returns ; could you not get that from their returns ; what port would they come in at for Rainy River ?

A. They might come in by Duluth, working in that way, but more than likely they come in at Winnipeg and take the boat at Rat Portage and go down the river.

*By Mr. Clancy :*

Q. You have really no evidence as to whether 284 people came in or thirty-two families other than Mr. Currie's statement in his report ?

A. Well, it would depend largely how they came in, whether by certificate or of their own free will—or perhaps it would be better to say without certificate.

Q. What do you mean by "without certificate or of their free will" ?

A. If Mr. Currie issued a certificate to a family and if that family presented the certificate at the boundary point and it was exchanged for a reduced railway ticket then of course the tracer is not so difficult, but if as a result of Mr. Currie's efforts in Wisconsin, one family or more decided to go to Canada without reference to Mr. Currie at all, without obtaining a certificate from him, then, of course, you could not trace them at all.

Q. When you say without certificate, you mean without referring to Mr. Currie ?

A. Without direct reference to obtain the certificate.

Q. Well, let us make this clear ; do our agents issue a certificate to every person coming to settle in Canada, to every head of a family ?

A. They are supposed to do so to every one applying, and I have no reason to suppose they do not.

Q. Then the number of certificates issued by Mr. Currie would correspond with the number of people he actually sent ?

A. No, the number of certificates Mr. Currie issued taken up by the Canadian Pacific would show the number of souls that went on each certificate.

Q. Have you these certificates ?

A. Oh, no ; they are not returned to us at all, they are returned to the Canadian Pacific.

*By Mr. Sproule :*

Q. They are presented for payment, are they not ?

A. No, they return these to them.

Q. They present them when they claim the reduced rate ?

A. Yes, they present them to the Canadian Pacific agent, who satisfies himself as to the bona fides of the person.

*By Mr. Wilson :*

Q. Does the Government pay the difference ?

A. No, the Government does not pay any fares at all ?

Q. They get lower fares on them ?

A. Yes, about 1 cent or  $1\frac{1}{2}$  cents a mile from boundary points to destination.

Q. Then have you any more definite information in regard to the other agents, Mr. Davies, Mr. Grieve, Mr. Holmes, Mr. Broughton, Mr. Bennett, Mr. McInnes, Mr. Caven, Mr. Crawford, and Mr. Rogers? Have you no definite information in that very connection, no more definite information than you have given in the case of Mr. Currie?

A. I cannot say that we have, the same system applies to all the agents. You might possibly find in occasional correspondence that comes to the Department where an agent has specially mentioned a certain family where they are coming, and you might be able to trace that particular family. For instance some of our agents have sent in parties or families with considerable money, cash, and they have made a note of that and informed the Department, saying where these men were going to settle. That of course would be an indicator that we would not have as to the people who come in generally.

Q. You stated in your report that there has been 44,543 declared settlers came in last year?

A. Yes.

Q. Do you mean by that that you have information they have settled in Canada?

A. No. I mean that they have declared their intention of settling here.

Q. Then the words, "declared settlers," do not convey the meaning that would be generally taken from them, do they?

A. Yes. If I were to say we had that number of actual settlers in Canada, that would be to the effect that they were settled here, but when I say they are "declared settlers," I mean by that that they have declared their intention of settling in Canada.

Q. No, if you had stated that there were that number of persons who declared their intention to settle here, that would have been a true statement, would it not?

A. That is what we mean.

Q. When that statement was made, it was on no better ground than that they stated they were going to settle here?

A. The number of immigrants arriving at ocean ports is checked there by the officers at the ports of landing, and they keep a record of those who signify their intention of settling in Canada and who have their tickets bought through to some Canadian point, and these are checked off again at Winnipeg, when they go through to the West, by our agents there.

Q. Now, Mr. Smart in his report as Deputy Minister says that 6,689 homesteads were located or taken up?

Q. Yes.

Q. And you report that 44,543 persons came as declared settlers, or rather persons declaring their intention to settle?

A. Yes.

Q. Mr. Smart also gives in his report 6,689—will you just consult the report so that we will get this down right, Mr. Pedley?

A. Is it the Deputy Minister's report, Mr. Clancy?

Q. Yes. That will be on page VIII. He gives the number of homesteads for the calendar year 1899 as 6,689 with 21,335 souls?

A. Yes.

Q. That would be equivalent to about three and one-fifth to each family, would it not?

A. About, I suppose, I have not struck the average but I suppose that would be it.

Q. When you speak of "declared settlers" you mean only foreigners that come in or people from foreign countries, you do not mean Canadians that return to this country or tourists, do you?

A. Do you include returned Canadians?

Q. I mean not returned Canadians who lived in the United States, but Canadians who have been travelling perhaps and returned.

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A. No, it includes Canadians that have gone from this country several years ago and come back.

Q. I do not mean that. That three and one-fifth would carry out what he gives there as 21,335 souls. Now, if you will turn to those who have homesteaded you will see that Mr. Smart states that the returned Canadians from the United States, I suppose he must mean by that persons who resided there?

A. I fancy so, these were not United States citizens. I may say that so far as this tabulation is made up, it is made up from an entirely different record to mine and I can only speak of it as I find it here.

Q. He gives 2,134 Canadians as a part of this number?

A. Yes, I see that.

Q. So that they form no part of the immigration that is brought in through our own officers, do they, into this country?

A. I should imagine so. I presume that is correct.

Q. Then he gives "persons who had made previous entry 720," that I take to be, following up the records, persons who had made entry and who did not fulfil the conditions and it would cover the overlapping from year to year, and practically belongs to a former year?

A. I do not know, I cannot speak authoritatively as to that at all; I do not know; I am not familiar enough with the system in vogue in the patent branch to say whether that means a man who had taken out a homestead entry and abandoned it and came back several years afterwards and taken out a new one, or, what it means. The person in charge—

Q. It can't include foreigners who come into the country that year?

A. It may possibly include some who came in from the States but the probability is it will include no one that came in from across the water. I don't know that it will include any from the States.

Q. Not likely. If we take these two items, the item of Canadians 2,134, and the previous entries 720, we have left 3,835, have we not, as the persons who are supposed to be foreigners or those who have been sent into the country by our agent?

A. I suppose that is it.

Q. Will you just look into that so that we will be right?

A. There are—

Q. 2,134 Canadians from the Eastern Provinces?

A. 2,854 do you make it?

Q. Yes, I think that would be it, that taken from 6,689 would leave how many?

A. 3,835.

Q. 3,835? Now you didn't include—you have included no Canadian other than those who made returns having resided in the United States, in this 4543?

A. No.

Q. Now then, have you applied the same rule that Mr. Smart did to the whole of them, namely?—

A. I would not be sure about that whether in the statement about the Canadians returned from the United States; they may possibly be included.

Q. Oh, no, he says here they are from the Eastern Provinces?

A. Those are the Canadians from the Eastern Provinces, but I am talking about the Canadians returning from the United States. It is quite possible they may be included in the returns.

Q. Oh, no, you give them as 105 so it does not include them?

A. It does not include the 720.

Q. If you apply the same rule that Mr. Smart has to the 6,899 giving 21,355 souls that accompanied these entries, to the 3,835 you will have 12,272 souls, would you not, that is with  $3\frac{1}{2}$  to an entry?

A. 12,272, that is on the basis of  $3\frac{1}{2}$ .

Q. Besides there will be no variation of it. He has given it for the whole of the entries?

Y. Yes.



Q. That would indicate that 12,272 persons outside of Canadians have been settled in that country?

A. No.

Q. What?

A. No, it does not indicate that at all.

Q. What does it indicate?

A. Because there was given—

Q. I mean as far as homesteads are concerned?

A. It means that the number of souls represented by the homestead returns on an average of  $3\frac{1}{5}$  for each homestead, gives 12,232; there is no doubt about that.

Q. Have you any other returns?

A. There are 906 people who came from the United States and settled in the Lake St. John district.

Q. I mean the homesteads. Have you any other than what are there?

A. Not that I am aware of.

Q. Then that, includes all the persons entered on homesteads—21,335 settled on 6689?

A. According to that return that is the way it figured out.

Q. Then, so far as the homesteads are concerned, leaving out the Canadians, 12,232 persons settled on homesteads during the year?

A. Yes.

Q. Now, then of the declared settlers that you report at 41,543, if you deduct the number you give there on the homesteads, you have 31,272 persons that you cannot account for, but that you call declared settlers—how do you account for that?

A. The 7,400 Doukhobors who came out here did not homestead. They must be deducted from the 32,000, that leaves 24,600, that brings it down 24,600. There were about 2,000 that came from the United States, that did not go to the North-West, 906 brought in through the efforts of the Quebec and Lake St. John Colonization Society and settled at Lake St. John. They report 906 who are included in our 44,000, and if we include them we must deduct them, because they did not go to the West, and did not homestead. They did not homestead in Quebec; we have no control over their lands there, they settled on provincial lands. Nine hundred and twenty-seven came in through the efforts of the Repatriation Society of Montreal, who are settled mostly in Quebec, in the Lake Temiscamingue district.

Q. You do not count them in?

A. In the 44,000.

Q. No?

A. Yes, I will just read my report.

Q. You do not?

A. And you will see there, because that is one of the questions I answered Mr. Sproule in the beginning of my examination as to how we figured up the figures.

Q. I want to see how these figures come out a little later on.

A. To Lake St. John, 906, to Rainy River, 227, Lake Temiscamingue and Lake St. John, 973. I said 927, it is 973. That accounts for about 19,000.

Q. That is homesteaders?

A. No. These are people brought in from the United States.

Q. Where do you get your report from?

A. From the Montreal Society, of the number of people brought in through them from the United States.

Q. That is no part of your immigration system?

A. It is part of our system in that we give them \$2,400 a year.

Q. They are not your agents?

A. They are not direct agents in the sense that the officers of the society are paid by us. There is an appropriation made to them by our immigration vote of \$2,400.

*By Mr. Wilson:*

Q. And do you mean to say that the population of Quebec is increasing?

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A. That is something I cannot say without having the mortality returns, because I cannot in the first place tell what the birth rate is over the death rate.

*By Mr. Sproule :*

Q. You said that 973 went into the Lake St. John district ?

A. 973 went to Lake Temiscamingue. I think the proper way to put this is that they came through the efforts of the society to Montreal and settled in Quebec, mostly in Lake Temiscamingue district.

Q. How many were there in Lake St. John ?

A. 906.

Q. And what other districts ?

A. The Rainy River, 227.

*By Mr. Clancy :*

Q. Those were settled by whom ?

A. Those were returned to us as having been settled by the Rev. Mr. Burriss, our agent in Port Arthur.

*By Mr. Sproule :*

Q. That would be in 1901 ?

A. About 1900, yes.

*By Mr. Clancy :*

Q. How many does he report there altogether ?

A. This is his report.

Q. Mr. Currie says he sent 284 there ?

A. Not to the Rainy River district. He sent that number from Wisconsin, and 32 families went to the Rainy River district from Wisconsin. He says 32 families. He reports families going in, and he reports 284 persons.

Q. As I understand Mr. Currie's report he says that 284 people left Wisconsin for Canada. One family of those left who have left that State went to southern Ontario, and 32 families went to the Rainy River.

A. I do not infer that the 284 people are included in the 32 families he mentions.

Q. Have you any inference as to the other ones ?

A. My only inference is that they went into the North-West.

*By Mr. Sproule :*

Q. Now you have 21,091 not accounted for yet, taking all these off ?

A. Now you take the excess of land sales over last year, amounting to about 105,000 acres —

Q. What has that got to do with it—what proof have you that the land sales is an indication so far as a record of immigration ?

*By Mr. Roche :*

Q. They might have been sold to non-residents ?

A. Well, I think Mr. Roche is pretty familiar with the land sales, say of the Canadian Pacific, and I think the most of their land sales are to bona fide residents.

*By Mr. Clancy :*

Q. What record have you of the land sales as accounting for these 21,000 ?

A. We have the record from the railway companies of the sales of land every year, and all of these are taken by the Department as indicating a movement in the taking up of land.

Q. But have you any proof that any of these 21,000 not accounted for have taken up land?

A. No, and probably the Canadian Pacific do not know.

Q. Then it really has no connection?

A. As far as I understand you are trying to ascertain whether the number of people counted by the immigration department as coming into Canada as declared settlers are settled here; you are trying to arrive at that?

Q. Yes.

A. And we take as one evidence of that the homesteads. We take as another evidence of that the people that are reported to us as actually settled in the province of Quebec, some 1800 or 1900, and we take as another evidence of that, the land sales.

Q. What evidence have you of that?

A. Of what?

Q. That any of these people have settled themselves on these lands?

A. We have the evidence of the land transactions from the owners of lands—the Canadian Pacific, which is the largest owner—that they have disposed of more land this year than last.

*By Mr. Roche:*

Q. Probably to people living there for years?

A. Most of it goes to outsiders just come in.

*By Mr. Sproule:*

Q. Are there any conditions of sale that they must reside on the land?

A. The conditions are a ten-year payment plan and ten per cent instalments; ten per cent cash down, ten per cent the first year and the second year is allowed to go free, and then they make the other payments.

Q. But no condition of actual settlement accompanies the sale?

A. No, the only condition is the man pays his money in advance.

Q. And the man might live in South Africa?

A. Yes, but not very likely.

*By Mr. Clancy:*

Q. Have you, Mr. Pedley, any evidence that a single person of these 43,000 that came into the country purchased any of this land reported by the Canadian Pacific?

A. No.

*By Mr. Rogers:*

Q. A good many might come in as agricultural labourers?

A. Yes.

Q. With a view to settling there?

A. They might do that.

*By Mr. Clancy:*

Q. We are not dealing with suppositions, we are keeping to the record. Now, Mr. Pedley, have you correct data for stating that 44,000 and odd declared settlers come into Canada last year?

A. I have given the Committee the data before in my evidence.

Q. Now take the reports of our agents at St. John, at Halifax, at Quebec, and at the city of Montreal and compare it with yours. The aggregate of English and Welsh, if you will turn up the report—take St. John first—there are how many English and Welsh at St. John for both cabin and steerage, give them each separate?



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A. On page 45 of the report on immigration, page 2 of the agent's report in St. John, under the heading of "Steerage passengers for Canada at St. John, N.B." the number of English is given as 422.

Q. Is that cabin or steerage?

A. It is steerage.

Q. Four hundred and twenty-two?

A. Yes.

Q. Yes, and Welsh?

A. The Welsh are not specified.

Q. None reported. Now, cabin.

A. Cabin passengers for Canada, English 193.

Q. Any Welsh?

A. Welsh, 3.

Q. Now that would include all the English and Welsh that landed there?

A. Destined for Canada.

Q. Destined for Canada?

A. Yes.

Q. Now will you take Halifax.

A. I think he has it a little differently classified here. The steerage passengers for Canada reported by the Halifax agent, English, 2,345.

Q. And Welsh?

A. Welsh, 15.

Q. Yes.

A. The cabin passengers for Canada at Halifax, English 527, Welsh 1.

Q. Now take Quebec?

A. The steerage passengers for Canada reported from Quebec, English 5,479, Welsh 80.

Q. In cabin?

A. "Cabin passengers remaining in Canada" reported from Quebec, 2,478, English, and Welsh 11.

Q. Yes, now then take Montreal, please?

A. Cabin passengers—I am not quite sure whether this classification is the same—he reports page 87 of the Agent's Report.

Q. There are two reports there, one from the Canadian Steamship Line and the other by railway from across the border?

A. The immigrant arrivals reported from Montreal via ocean ports are given as English 153, Welsh not specified. The immigrant arrivals at Montreal via United States is given as English 93, Welsh not specified.

Q. Now Mr. Pedley, you have for St. John 618,—will you take this down please, the reporters will have it exactly?

A. You wish me to take it down?

Q. Yes, from St. John you have these figures 422-193, and 3, making 618 and the other ports. Now will you see what the whole of these amount to?

A. 11,800.

Q. How many did you report?

A. 10,660—no, it is 8,576.

Q. How do you account for that difference?

A. Because we report the "declared settlers."

Q. Well did you report the "declared settlers" on the number that came in? Did you now?

A. We reported those who declared their intention at the ports of arrival of settling in Canada.

Q. We take this number of persons who came in as English and Welsh amounting to nearly 3,000. Were they persons that you had reported they did not intend to settle in Canada?

A. Were there any persons —

Q. There were 11,800 in round numbers who came in and you report 8,000 and odd as declared settlers?

A. Yes.

Q. How do you make the distinction between those declared settlers and the whole number that came in? What evidence have you? In other words how do you know that 8,000 and odd were declared settlers and the balance were not?

A. Because they were checked off there by our agents and officers.

Q. They came on to the United States, did they not?

A. No.

Q. Then what has become of them?

A. They may just have come over here on a visit and have gone back to the Old Country for aught I know. You see you are including the cabin and steerage passengers.

Q. Yes, but very few of these came cabin? Now, do you take the reports of the agent for that in every case?

A. Yes, they are the only ones that can check it, the agents at the port of landing. They take the ship's manifest and count those on board the ship.

Q. And that does not appear. Why don't they appear as persons coming into Canada as settlers?

A. Because there has been a rule adopted for a great many years that, generally speaking, steerage passengers are included as immigrants.

Q. The difference between 11,000 and the 8,000, what do you think about the 3,000?

A. The 3,000 are those that do not declare their intention of settling in Canada.

Q. Let us just turn up the other nationalities and see how you work that out with regard to the others. We will take the Germans.

A. Germans.

Q. Seven hundred and thirty came in. You report 780 as declared settlers. How do you account for the two cases?

A. What statement are you referring to now?

Q. I am referring now to the 730 as those reported at Halifax, St. John, Quebec, and Montreal, 730, and you report 780 as settlers, declared settlers.

A. The figures are: Germans, 14 cabin passengers, reported at St. John for Canada, and there are 5 steerage passengers reported at St. John for Canada; the cabin passengers reported at Halifax, of Germans, is 9, and of steerage passengers, Germans, 81. At Quebec the steerage Germans were 312, and cabin passengers remaining in Canada, Germans, 38. At Montreal the Germans via ocean travel were 357, and via the United States, 33.

Q. Well, how many are there?

A. —

Q. Now, what evidence have you that there were 11,545 Americans brought in?

A. If you look at the evidence I think I have answered that before.

Q. That is through McInnes, through your agent in the United States?

A. No, we have their figures, but the evidence we have is the number that report directly at Winnipeg. Those that are reported from Portal and Coutts, and those that are reported at other points. I gave the figures to the Committee I think, the first or second day of my examination. It is in my evidence in the first or second day's evidence.

*By Mr. Roche:*

Q. You have a Mr. Paul Wood engaged in your Department as an immigration agent or in some capacity?

A. He is engaged from time to time up at Dauphin.

Q. In what capacity?

A. Looking after the immigration, as a land guide and generally as an immigration agent.

Q. Is he an interpreter?

A. I think he speaks two or three different languages, and will be used from time to time by Mr. McCleary as such whenever necessary.

## APPENDIX No. 1

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
FRIDAY, June 1, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock a.m.; Mr. McMillan, Chairman, presiding.

Mr. FRANK PEDLEY, Superintendent of Immigration, was present at the request of the committee and examined.

*By Mr. Wilson :*

Q. You said in one place in your evidence here that the expenditure on advertising in the United States was \$14,000 and in another place it was \$38,500. Now, perhaps you can explain whether these are two different items or whether they should be added together; I just want to get the correct amount.

A. The item of \$14,018.44----

Q. Is that for the newspapers alone?

A. — is the amount that appears in the Auditor General's report for the fiscal year ending June 30, 1899, as classified by him for advertising in the United States.

Q. That finishes up the fiscal year; your year is different?

A. Ours is the calendar year. The item of \$38,500 includes all of the advertising in the United States for the calendar year 1899 as analysed by the accountant of our Department; it includes all the expenditure that is made by the Department in the United States for advertising and printing of literature of all kinds and descriptions.

Q. Well, then, the accurate amount is just the \$38,500, that covers everything, does it?

A. That covers everything that was spent by the Department in advertising in newspapers, printing atlases, and the printing or purchase of pamphlets—on literature generally: that is the amount that was spent in the United States, but as a matter of fact it should not be charged entirely to the United States because a good deal of literature bought there was distributed in Canada and the Old Country—\$38,500, which also includes not only the general advertising which I mentioned the other day as being done through large firms, but also what was done through local agents in their own districts.

Q. I have got the information I want; the two items are not to be added together but the larger amount is the total amount and covers everything?

A. Yes. The \$14,000 is just taken from the Auditor General's report.

Q. I have got down from the evidence here that the commissions paid in the United States to your agents amounted to \$4,785.

A. Yes.

Q. Well, then, I have the total expenditure in the United States for the year as \$83,500?

A. That is for the calendar year. I qualified that statement to the extent of saying that it was only approximate, because the accountant could not make an absolutely accurate statement except on the fiscal year basis.

Q. It is too bad that these accounts are kept that way?

A. I do not know how long they have been so kept.

Q. You say here, "I have the total expenditure and classified expenditure in the United States, \$83,500, including salaries, expenses of agents, sums for advertising and commissions on settlers. The total expenditure in Great Britain and Europe is \$80,000." I would like to have that divided up?



A. I would say as to that, that a clerk in the accountant's office is working on it now and I may have it before the Committee rises. It means the dissection of a lot of accounts generally kept together. For instance, the English and Welsh are not kept together as such.

*By Mr. Clancy :*

Q. The English and Welsh are the only ones in that position ?

A. No, the Old Country expenditure, you will understand, is made by the High Commissioner. An account comes in from Belgium, for instance, and if this account is satisfactory he pays it. Accounts coming in from Ireland and Scotland are treated in the same way, but when he is sending in his statement he does not classify them as Belgian, Irish or Scotch but sends in his monthly statements and we can only get at it by going over the vouchers.

*By Mr. Wilson :*

Q. Are you going to give us the expenditures in England and Wales ?

A. As far as we can detach the English and Welsh expenditure from the general expenditure.

Q. Then, you will give us the expenditure on the Continent separately ?

A. Yes. I wish to say that it is impossible to get at the absolute expenditure on the Continent. For instance, we get 100,000 copies of a pamphlet from an English firm and 25,000 of these will be distributed on the Continent. The Committee will understand that these statements must be taken more or less as approximate.

Q. Now, you gave us the days travelled and in the office of all the United States agents but two; can you give us the particulars about these two agents now? These were Messrs. Crawford and Rogers; have you been able to find out about them ?

A. I have a letter from Mr. Rogers, who thought he was complying with the requirements of the Department by his usual correspondence and also by his monthly statements of disbursements, which, if you have gone over them on the file of the Auditor General, are very full.

Q. I have not, I cannot go over everything.

A. No. That is the reason Mr. Rogers gives. He intimates that he thought he was conforming to the instructions of the Department by sending in, as he does, pretty voluminous reports and disbursement statements, and Mr. Crawford takes pretty much the same ground.

Q. Then, you stated that the expenditure in Great Britain and on the continent was \$80,000 ?

A. That is the statement furnished me by the accountant; that includes the bonuses paid by the High Commissioner on English and continental immigrants.

Q. I see you say in your evidence of May 4th that the expenditure in Canada included salaries, contingencies at seaports, expenditure made by Mr. McCreary, the grant to the Quebec and Lake St. John Railway Company, and altogether you give \$224,363.35; is that correct ?

A. Yes; that is, of course, this quotation is as to the expenditure for the calendar year, and if you put these figures together—\$80,000, \$83,000 and \$224,000—you would see they are more than our appropriation of \$360,000. The explanation of that is that the appropriation of the previous year overlaps several months of the calendar year of 1899, and therefore these figures must be taken with considerable care by the Committee as they are only approximate. You can only get absolute figures by taking the fiscal year.

Q. Well, don't you think it would be wise for you to recommend to your Department a change of the time so as to correspond with the fiscal year, in order that the accounts might be comparable and that we might get at the facts instead of your saying as you do now, that the accounts are only approximate. It does not seem to me that it would be difficult to change. You as head of the immigration department, as Superintendent should, I think, make that suggestion.

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A. It is a matter that has been discussed, although I do not know just whether with the view of making such a change as is suggested.

Q. You can quite see how unsatisfactory it is?

A. For certain purposes of classification it is difficult, but of course the actual expenditure for my particular item can always be ascertained.

Q. It can be by going to the office and getting an officer to look it up, but I do not see why we should not be able to go to the Auditor General's report and find that just as in any other Department?

A. I do not know whether all the Departments report for the fiscal year or whether we are the only one. The suggestion that has been made however will be borne in mind.

*By Mr. Macdonald (Huron):*

Q. How long has that system been in vogue?

A. It has been in vogue for a great many years.

*By Mr. Clancy:*

Q. I wanted to ask a few questions with regard to Mr. Rogers and Mr. Crawford. I understood from what you said that you have had some communication with those gentlemen since the last meeting of the Committee?

A. I have not from Mr. Crawford. I had a letter from Mr. Rogers three or four days ago since the last meeting of the Committee. The communication was written by him before the last meeting of the Committee. It was received, I think, some time during the latter end of last week, but I am not sure of the day. It was in response to a communication from me, that the Committee had asked for his diaries and I would like him to furnish them, and he wrote to the effect that he has not kept the diary except in so far as it involved a statement of disbursements, and his letters to the Department giving information required from him from time to time by the Department.

Q. Have you ever called Mr. Rogers' attention to these lapses before?

A. Yes, Mr. Rogers has been written to from time to time to conform more particularly to the instructions of the Department.

Q. It would seem now that Mr. Rogers refuses to give the information you have required of him?

A. No. I would not like to say that Mr. Rogers refuses to give the information. He evidently has a misconception of what the instructions were, or thought that by sending in his itemized statement of disbursements every month which shows where he was, what he was doing and what his expenses were, that he followed the instructions of the Department.

Q. It has been a matter of controversy between him and you as Inspector as to whether he was to conform?

A. It is not exactly a matter of controversy, it is with the desire in my own mind to satisfy myself from month to month as to the work of the agents, that I have thought it necessary to write them occasionally with reference to their reports, simply to keep a close check on what is being done.

Q. How long has Mr. Rogers been sending in these incomplete reports?

A. He has been sending in his monthly statements from his appointment. We won't pay them their expenses unless they send in their statements.

Q. But they are only as to his disbursements?

A. No, they show the amount of fare, say, from Watertown in South Dakota to Yankton on such a day, what he paid for hotel expenses, for baggage transfer and for livery, &c.

Q. That is a very long statement you have made, but, after all, is that not a statement of his disbursements?

A. It is more than a statement of disbursements.

Q. How?

A. It is a statement of how the disbursements are made.

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Q. Well I thought that the statement of disbursements included how they were made; a man to put down \$25 with nothing at either end is hardly giving a statement of disbursements. Now let us not have any apologies for these men?

A. I am not apologizing for them, I am stating facts.

Q. This matter came before the Committee and I made the statement, and make it here now in the interest of the Department, that there is either laxity on the part of these men or proper pressure is not brought to bear on them to send in these accounts. It seems strange that Mr. Rogers' attention should be called to the matter and yet he persists in assuming that his instructions are being complied with; that is the substance of it, is it not, Mr. Pedley?

A. Mr. Rogers says he thought he was giving the information required by the reports and statements of disbursements sent in from month to month.

Q. Do you propose as Inspector to see that he will send in these the same as the other agents?

A. I propose, with the concurrence of the heads of the Department, to do everything that lies in my power to bring about the best possible results as far as our immigration work is concerned, and I want to say now that Mr. Rogers is probably one of the best of the agents we have.

Q. Don't let us take up time with a speech; that is not what we want; that is a little padding out, you will see; I have not questioned his work in any sense, but I am making a reasonable demand that there should be given by Mr. Rogers the same information as other agents, if he is a better agent. Now, the answer you gave a moment ago when you spoke in general terms, was, that with the concurrence of the Department you will do what you can to bring about an efficient state of affairs?

A. To bring about the best possible results as far as our work is concerned.

Q. But you refuse to say you will insist that these men who have not put in reports properly will do so?

A. No, I do not like to say that. The ground I take is this, that where there would be reasonable cause for a man who is doing good work for the Department not conforming exactly, but practically in spirit, to the instructions of the Department I might go so far as not to insist upon strict compliance.

Q. Has there been a reasonable excuse?

A. There has been what we consider a reasonable excuse in the fact that we do not care to penalize our agents because they do not comply with the exact letter of their instructions.

Q. What do you mean by penalizing them; others have not been penalized?

A. No.

Q. What is the difference then?

A. The only difference in their case is that they have not in their diaries in accordance with the instructions of the Department.

Q. Notwithstanding you have insisted from time to time?

A. We have insisted on them sending in their reports and Mr. Rogers says he thinks he has complied with that.

Q. Now we have that, and Mr. Rogers would necessarily give whatever excuse he thought proper. Now you say you think it would be penalizing these men to insist on their sending in reports the same as others?

A. No; the way to penalize them would, in my opinion, be to stop their salaries and then they would send in reports, but that would be a rather drastic measure and especially when you deprive men of the means of carrying on the work that is being very well carried on by Messrs. Rogers and Crawford.

Q. Do you think you have a faithful fulfilment of their duties as far as regards the accounts?

A. In literal compliance with the instructions of the Department they have not, but as far as making the Department aware of their movements and the carrying on of the work of the Department they have done so.

Q. Then you think it is complying with the instructions?

A. Technically they are not.



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Q. Well, in the essence is it; is there any evidence they were at these places if they kept no diaries?

A. Yes, we have the evidence in Mr. Crawford's case of his being at a certain place and sending off so many settlers. We have photographs of the cars and the settlers loading them.

Q. Is that a special case?

A. He was sending three trains out.

Q. How about the balance of the year?

A. I could not particularize about the balance unless I went over the year's work.

Q. Well, I will let the people judge. There are two men in the Department who refuse to send in the information which others do and as a wholesome practice I am willing to leave it with them; they gave a sufficient excuse to satisfy the Department?

A. I will not say that they have given a sufficient reason to satisfy the Department, but they should not be penalized.

*By Mr. Ingram :*

Q. What are the total disbursements of Mr. Rogers and Mr. Crawford?

A. For which year?

Q. Last year?

A. Well, I have not the figures here; if you have the public accounts they will appear for 1899.

Now, then, at the close of the last day's work I was being examined by Mr. Clancy as to some immigration figures. I don't know whether you closed that portion of your examination.

*By Mr. Clancy :*

Q. Well, I think there were some matters you were not quite able to make clear that day. One of the things we were endeavouring to get was, taking the United States, the number of persons upon which the commission had been paid with respect to age and sexes; you have not made that statement yet.

A. There is a statement that is being made out now showing the number of commissions that have been paid to local agents in the various states.

Q. The number of persons that have been brought from the United States upon which commissions have been paid, that is what I want?

A. Yes.

Q. I am not going to ask for the number paid each agent, that would be a very long task, I see, from the details that have been given, but I want the number of persons upon which commissions have been paid, with their respective sexes and ages, the number above 12 years of age being separate?

A. I think I can furnish that—I am not sure as to the sexes and ages, but I think I can, as our commissions are upon an age basis.

Q. And the sexes as well?

A. Yes. We possibly might be able to give the numbers, because the certificates issued by the commission agents and collected by the railway agents at the boundary crossing are retained by the railway agents, who send in the number of those who have come in. We may not be able to tell the persons themselves, but we could tell the number.

Q. Are there not certificates given by our agents from there at the time?

A. The certificates are given by the agents to the settlers.

Q. Well, he leaves there presumably to enter Canada?

A. Yes.

Q. When he leaves there he has a certificate, as I understand it, from our agent?

A. Yes.

Q. And he presents that certificate as a means of getting a better railway rate, when he reaches the boundary?

A. Yes.

Q. And these certificates are issued to intending settlers and are reported to you from your agents?

A. Yes, they are reported from time to time, when demanded. Do you mean the commissioned agents or the salaried agents?

Q. I mean the salaried agents.

A. Yes, when requested to do so by the Department. We send them a book with the certificates in duplicate, or rather with the certificate proper which is handed to the settler and the stub which is retained by the agent.

Q. Can you produce these to-day?

A. No, they are in the hands of the agents, they are only returned to the Department at the request of the Department.

Q. Do the Department never have any check in paying the commissions to the agents—is the railway report a proper check?

A. Yes, the Department knows what certificates are issued, and they know what certificates are collected, as the railway companies return the numbers of the certificates and the clerk can check them off.

Q. Will you give us that information, at the next meeting of the Committee, with regard to the United States? That is, the number of persons upon which the commission has been paid from the United States, from each State, including the sex and the age, because, as you know, the sex determines whether a lower rate of commission is paid. I mean the ages above twelve, because upon those under that no commission was paid?

A. Under 18, that is in the United States.

Q. I thought you said twelve years?

A. No, the homesteading age in the North West is 18 years of age, and those who come in there over 18 years of age, if they are males are eligible to a homestead, and also if they are widows and heads of families, but if they are under 18, they are not. We pay \$1 commission to all others than those eligible for homesteads, that is, those under 18.

Q. Then I just want the sex of those above 18 and the number, and the number of those under 18. Of course that would include both sexes under that age?

A. On whom commission has been paid?

Q. Yes.

A. There was a question asked by Mr. Cochrane the other day as, to the number of parties on whom commission has been paid from Wisconsin. I am having a statement made up of the commissions paid, and I think it is on 34 persons and the amount is \$110. It is either 34 or 54, but the statement is being made out by the accountant so that the Committee will have it.

#### TERMS OF IMMIGRATION AND SETTLEMENT OF DOUKHOBORS.

Q. Have you the agreement with the Doukhobors?

A. I have here a statement of the arrangement under which the Doukhobors came to and settled in Canada.

Q. Do you mind reading that, please?

A. Regarding the Doukhobors, the arrangement made with the representative of the English Society of Friends who came out with two Doukhobor delegates provided that no demand should be made upon the Department for the booking agents' bonus, but that the Department would be willing to pay in to the credit of a committee appointed in Winnipeg, an amount equal to one pound for each person, the Society of Friends in the Old Country having chartered the vessels to bring these people to Canada, and no tickets having been issued, there of course has been no demand upon the Government for steamship bonuses, and consequently the Government has carried out its part of the arrangement in advancing a certain portion of the commission agreed upon for each settler.

The other considerations in connection with the Doukhobor emigration were that the Department would provide accommodation for about 4,000 during the

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winter months, it having been stated that the Russian Government had given permission for these people to leave Russia, but might at any time withdraw the permission and consequently they were anxious to come during the winter months. As a portion of the Doukhobors were not possessed of much money, it was determined to use this fund during the winter to purchase whatever supplies might be found necessary for their maintenance, as well as certain outfits that had to be procured in order to allow them to locate on the lands before the snow left the ground. Officers of the Department were sent to locate these people as in the case of the Galicians, and they were given certain territory north of Yorkton and west of the Swan River upon which to locate their colonies. There are three colonies in that district, and the last lot of arrivals, some 2,300 or 2,400 have been located in Prince Albert district, where lands have been selected for them. The townships in which they have been settled under the arrangement—

*By Mr. Wilson :*

Q. Before you leave that, you say the Government agree, in addition to giving them the bonus, that they would keep them for four months?

A. No. We provided them accommodation in the immigration halls, that is done for all immigrants, but we had to make a little extra effort in this case because of the large number that came in at once, that is all. I have the townships that they have settled in marked here on the map and I have it in a schedule also.

*By Mr. Clancy :*

Q. As to the Doukhobors, are they all here?

A. All but the 13 that left for California. The townships that have been reserved and selected by the Doukhobors are townships 39, 40, 41, 42 and 43 in range 7, west of the 3rd meridian.

*By Mr. Gilmour :*

Q. Where is that?

A. Up in the north-eastern corner of the district of Assiniboia.

*By Mr. Douglas :*

Q. I am sorry it is in my constituency?

A. They will not have a vote for two years yet, I suppose. They also have townships 39, 40, 41, 42 and 43 in range 8, west of the 3rd meridian, and townships 42 and 43 in range 9, west of the 3rd meridian. Townships 33, 34, 35 and 36, ranges 30 and 31, west of the 1st meridian. Townships 27 and 28 in ranges 31 and 32, and township 29 in ranges 31 and 32, west of the 1st meridian. Fractions of township 30 and 31 of the Indian Reserve on range 32, west of the 1st meridian. Townships 29, 30 and 31 in range 1, west of the 2nd meridian, east half of township 29 and townships 30 and 31, range 2, west of the 2nd meridian. Townships 30 and 31, range 3, west of the 2nd meridian. Township 30, range 5, west of the 2nd meridian. Townships 30, 31 and 32, range 6, west of the 2nd meridian. Townships 31 and 32, range 7, west of the 2nd meridian and township 32, range 8, west of the 2nd meridian. Here is a map showing the townships and showing the location of the Doukhobors.

*By Mr. Wilson :*

Q. Marked in red?

A. Yes, in the district of Assiniboia. The last lot are settled in the Prince Albert part, west of the Saskatchewan.

*By Mr. Rogers :*

Q. Are there any reserves in that district or do they take up all the land as it comes?



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A. In the Assiniboia settlements exchanges were made with the railways, so that they got the even and the odd sections. I think in the Saskatchewan district they took the alternative sections. I would not be positive about that, but the question of taking up solid blocks or alternate sections is one that has aroused a good deal of discussion and there is much to be said in favour of each system. I think the general opinion is now that the alternate section is the best.

*By Mr. Wilson :*

Q. I don't see why ?

A. The idea is, that when a man starts with 160 acres of land, if he gets on at all he will in three or four or five years want more land, and if the land is in a solid block and all settled he has to go farther away from his original homestead to buy.

Q. But you are forgetting their spiritual interests ; they have so much farther to go to church ?

No answer.

*By Mr. Clancy :*

Q. Now can you say what the cost last year of the Doukhobors was ?

A. The cost to the Department, that is over and above the bonuses, is about as was stated, I think, by the Deputy Minister in his estimate. I think that, although the accounts are not all in, it will turn out to be about \$20,000.

*By Mr. Wilson :*

Q. I think he said \$16,000 in his evidence ?

A. Did he ? Well, I thought he said somewhere about \$18,000 or \$19,000.

Q. The accounts are not all in, so that is just an approximate estimate yet ?

A. Well, the work was carried on pretty well until the end of the year and partly into the beginning of this winter, but from the outlying districts the accounts do not come in so promptly.

Q. Have you a statement of what you spent in Manitoba and the West for immigration ?

A. That is pretty hard work, because a good deal of expenditure is made from the head office and also a large part is made by Mr. McCleary.

*By Mr. Clancy :*

Q. That \$20,000 you are stating in round numbers ?

A. Yes, for which the Department will be repaid, and for which liens will be taken.

*By Mr. Wilson :*

Q. You are talking now about the money advanced on liens, not of the bonus ?

A. The bonus is \$35,000. This \$20,000 is over and above the bonus. Under the special arrangement, instead of paying the bonus to the agents, we paid the pound to the Doukhobors to help them to settle.

Q. This is not on liens ?

A. No, but the \$20,000 is made a charge ; as soon as the colonies are cross surveyed, so that we can identify the land, the liens will be taken.

*By Mr. Rogers :*

Q. When did the first Doukhobors come ?

A. The first Doukhobors arrived at Halifax on January 19, 1899. The last arrived in the first part of June.

Q. Is that the first ?

A. The first except the two Doukhobor delegates in 1898.

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*By Mr. Clancy:*

Q. Are you still making an effort to get more Doukhobors to come to the country?

A. I cannot say that we are distinctly specifying our efforts as to Doukhobors. As I understand it, there were at the time the Doukhobors started, 18,000 people, but the 10,000 or 11,000 outside of those that came to Canada, are scattered in different parts of Russia; some are in exile in Siberia, and it was thought that once the first instalment got settled, the others were likely to follow in detachments.

Q. But are you making an effort to have that carried out?

A. We are making an effort in a general way, but no specific effort in regard to these. We cannot place our hands on any particular village or colony of Doukhobors in Russia that we are working among. We cannot very well work among them, except through their leaders. They are the ones who will direct them from time to time when permission is granted by the Russian authorities, and when it is the best time to leave.

Q. Is it the policy of the Department to get them here if they can?

A. I cannot say as to the policy of the Department in that regard, except that I know nothing to the contrary.

Q. You know the work that is going on.

A. We are endeavouring to get all desirable people from Russia, that is of the agricultural class.

Q. I have not spoken generally, I asked if it is the policy of the Department to still encourage and if possible to get these persons to come here.

A. I have no reason to believe the Department is not in favour of the policy of having them come but no definite action is being taken to bring them out.

Q. Have you any reason to believe that the Department is anxious to bring them out?

A. I have no reason to believe the Department is not.

Q. You have no evidence of any special effort being made to secure them?

A. No, I have no evidence of that.

Q. Simply a pound a head is paid on these, all ages and all sexes?

A. All ages and all sexes.

Q. That is paid on Doukhobors?

A. Yes.

Q. Now with regard to the Galicians; what sum was paid them?

A. The Galicians were paid no bonus at all. At least the bonus paid on Galicians was simply the continental bonus of one pound per head for all adults.

Q. Nothing was paid on the minors?

A. Nothing was paid on the minors.

Q. That was paid, I suppose, to the steamship companies?

A. To the steamship agents.

Q. That is practically the steamship companies?

A. Possibly they have some arrangement.

#### GALICIAN IMMIGRATION.

Q. Can you give us the number of Galicians that the bonus was paid on last year?

A. No, I think not. I think I went into the question and it would involve an enormous amount of work to go over all our records. We would have to put ourselves in correspondence with the companies. Possibly I may be able to get the information by communicating with the High Commissioner's office. I think a general statement of the amount paid to the different nationalities was received about three years ago but it involved an enormous amount of work and I do not think the Department has kept it up. That is about the only way, because the shipping lists are furnished by the steamship companies, and are sent to our Commissioner at Winnipeg, who checks these people over and satisfies himself that they are all of

the agricultural class, that they are coming here to settle in Canada. He certifies to that list and it comes down to the head office and I go over the list then and check it over with one of my officers, to see there are no duplicate bonuses being paid. I certify it and it goes to the High Commissioner's office and he checks out the amounts due under the certificates that have been issued.

Q. On what statement is the bonus paid to the company, or the agents?

A. Under the present arrangement the bonus is paid when the passenger sails.

Q. Well, you stated a moment ago that they were paid when they reached Winnipeg?

A. The bonus is paid when the passenger sails.

Q. You state that when they reach Winnipeg they are checked over to see if they are intending agricultural settlers?

A. Steamship companies furnish a list to the High Commissioner—a duplicate list—of the parties upon whom the bonus is paid. Instead of waiting as they used to have to do, for six or eight months before all the difficulties are straightened out, the High Commissioner will give them a cheque for the amount claimed or for a sum in advance. On the final adjustment the balance is then paid. The steamship companies are entirely reliable, of course, and the differences between the Department and them are so small that if we ever have to get a refund it is immediately paid.

Q. Have the steamship companies given any undertaking to see that the statements of the booking agents are made up correctly?

A. The steamship companies are instructed that the only passengers on whom a bonus will be paid are agricultural settlers.

Q. Do the steamship companies give any undertaking that the statements made by the booking agents—who may be connected, and are connected in a sense with the steamship companies—that the statements they make in regard to the character of the immigrants are reliable?

A. I am sure no understanding is made or any undertaking given. The instruction given to the booking agents is that if the people they send here do not conform to the class that we intend to pay the bonus on, they do not get the bonus.

Q. But it is paid in advance?

A. But we have an undertaking with the steamship companies that where we say a man is not entitled to the bonus we do not pay it?

Q. The steamship companies refund it?

A. Yes. I think it fair to the Committee to say that the reason for that is, that the steamship agents complained very much at the delay in getting their bonuses and we found the agents were not working with the enthusiasm they would have shown if they were paid.

Q. Now, you reported 6,700 Galicians as coming into the country?

A. Yes.

Q. 6,900 reported by Mr. McCreary and 6,700 by you? However, it is not a great difference. Is it really a fact as to the number of bonuses paid, that the Department is unable to give information upon that distinct class of persons as to how many a bonus was paid on, to the steamship agents?

A. No, we could give it on a close analysis.

Q. Is it a fact that the Department is not now in possession of that information?

A. I am pretty safe in saying we have not the information in the Department now; the High Commissioner will have it.

Q. And does he never report to the Department?

A. He has reported when we asked for it. The High Commissioner can make up a statement because he has all the statements.

Q. Does he not send the records or copies of them here?

A. No, he keeps the records.

Q. Or copies of them?

A. No. He sends in reports of the work and returns us the vouchers so that we can keep our financial statements correct, but this is a subdivision which does not particularly affect the Auditor General or the Audit Office.



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Q. I am not discussing that feature of it, I want to know if you can state to the Committee whether you have information of the number of people above 18 years, of the Galicians on whom a bonus was paid to the steamship agents?

A. I have not the information over in the Department; that information could be procured from the High Commissioner.

Q. How do you know it can?

A. Because he made out statements two or three years ago, covering some twelve years, of the amount paid out in bonuses to different nationalities.

Q. But you have not any information beyond that now?

A. No.

Q. Have you any better information regarding the people who left Ireland?

A. The only report we have as to the people who left Ireland will be the reports of the Irish agents as they appear in our reports.

Q. Have you a return of the bonuses paid on Irish immigrants?

A. That will be in the High Commissioner's office.

Q. Or those from England and Wales?

A. England, Wales and Scotland are all the same.

*By Mr. Cochrane:*

Q. Before you leave the Galicians, how can you check them—I understand you to say the Galicians are checked in number to protect yourself from any fraud—how can you do that without information in the office that so many were booked?

A. We have the passenger lists sent to Mr. McCreary.

Q. Does not the passenger list show how many Galicians come?

A. No, the passenger list shows the number of people that were booked sailing from Hamburg.

Q. But not the nationality?

A. In regard to nationality some of them may be Germans and given as such. Nationality is a poor guide. An Irishman who had been living for ten years in England will put himself down as an Irishman, or a Scotchman, the same.

Q. I understand you have information enabling you to state there were so many thousand Galicians settled in Canada?

A. Yes.

Q. Now I understand your agent in Winnipeg checks them over to see whether the Galicians are the class they should be?

A. Yes.

Q. Well, now, if you have not the information and that comes back and you check it, what information have you to form your conclusions on?

A. Well, of course we could identify the Galicians who arrive in Winnipeg, but the point Mr. Clancy was discussing was whether we could state the number of Galicians on whom the bonus was paid. That is in the High Commissioner's office. We can tell every Galician that arrived.

*By Mr. Clancy:*

Q. You don't know now as regards the 6,700, the Department at Ottawa does not know how many you paid a bonus on?

A. I am safe in saying the information is not in our hands now.

Q. It is very deplorable.

A. But it is in the possession of the High Commissioner.

Q. And that pertains to the others, that same want of information?

A. Well, it is not a want of information, I do not care to admit that we have not the information; it is in the possession of the officials in the High Commissioner's office. The commissions are paid by the High Commissioner and he has all the information; we have his report over in the Department.

*By Mr. Macdonald (Huron):*

Q. I understand you to say that the information is in the hands of the Government, but this special information is in the office across the sea?

A. Yes, the certificates are all sent to the High Commissioner to pay the money and kept by him.

*By Mr. Cochrane:*

Q. As I understand the Department has no information regarding the amount of money paid on the Galicians for the last three or four years.

*By Mr. Macdonald (Huron):*

Q. Now, do I understand, Mr. Pedley, the office across the sea is part and parcel of the Department?

A. As far as immigration is concerned. I can get the information to-day by cable if the Committee desires it.

*By Mr. Moore:*

Q. I would like to ask Mr. Pedley a question: Is there any objection why the Department should not furnish this information? We have been here for two months and the investigation has been going on all the time, and upon one of the most important points we are told we cannot get the information asked for. If the information was here instead of across the water, we would not have to take up all this time about a question that should be answered. I do not blame Mr. Pedley, he is doing his duty, I think, as fully as he can, but it seems to place us in an anomalous position when we find Dr. Macdonald asking questions to throw blame upon the Conservative party because they did not ask such questions twelve or fifteen years ago. One of the very good reasons for not asking them at that time was that we did not import Galicians or Doukhobors.

A. There is no objection whatever that I know of to furnishing that information. It is probable I will have to cable to the High Commissioner. But it can be done, there is no difficulty about that, in getting that information.

*By Mr. Wilson:*

Q. But it will be a lot of expense, will it not?

A. There will be the expense of cabling, and it may take him some time to go over his records to find out upon how many Galicians the bonus was paid—men and women. I can bring the statement and lay before the Committee, the statement that we receive, covering a period of twelve years, if that will be of any use, and if the Committee desire it, I shall take steps at once to get the information required from the High Commissioner. There is no object in concealing it, and we know that except during an interval when it was stopped, the bonus on all settlers, including Galicians, was paid.

#### ORIGIN OF GALICIAN IMMIGRATION.

*By Mr. Moore:*

Q. When were the first Galicians imported?

A. Somewhere about 1894 or 1895. There was a batch of Galicians came in here in May, 1896. I went into the matter some time ago and found that the correspondence was started at the time the predecessor of the present High Commissioner held that position. A gentleman by the name of Oleskow, from Austria, came out and interviewed the then Minister of the Interior, Mr. Daly, and the Commissioner of Lands, Mr. Smith, who had control of immigration matters in the Winnipeg district. As a result of that correspondence, Mr. Oleskow took a trip through

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Manitoba and the North West, in 1895, and, as a further result of that, 126 Galicians, about the first distinct batch landed here in May. Since that time they have come in large numbers.

Q. And the Doukhobors, when did they come ?

A. The first batch came here in the winter of 1899.

*By Mr. Gilmour :*

Q. Were these Galicians assisted by the Government in 1895, these 126 ?

A. Assisted by the Government ?

Q. Yes.

A. In what way ?

Q. In any way.

A. I do not know that I can say definitely that they were assisted or not. There is no assistance given to the Galicians except in the case of the bonus.

Q. Was the bonus paid on them ?

A. The bonus has been paid for twenty years, just the same as in this case ; the bonus has been in force since 1882 ; the bonus was arranged for, when immigration was in the Agricultural Department under Mr. Pope.

*By Mr. Wilson :*

Q. You found this to be a good thing and continued it ?

A. I certainly do not think it would be possible to work without a bonus.

*By Mr. Ingram :*

Q. I understand that the government did away with assisting immigrants altogether at one time.

A. We do not assist them, only in the ordinary course of work, if a destitute family makes application in the North West we supply them.

Q. I am speaking of Old Country people. At one time the government did assist them ?

A. Not that way.

Q. By bonus and otherwise, and then did away with that system ?

A. No, that bonus has been in force for twenty years. It is a bonus paid to the steamship agents to work in the interest of Canada. I do not know if there ever was a system of assisted immigration.

*By Mr. Macdonald (Huron) :*

Q. There was a policy to assist passages during Sir John Carling's time, but it was repealed ?

A. Yes.

*By Mr. Ingram :*

Q. I see in Mr. Jury's report he is opposed to tenant farmers as immigrants ?

A. He is not opposed to them.

Q. He says they are not a good class to come to Canada ?

A. Oh, no, he says they are not likely to come to Canada.

Q. Mr. Jury says this. " My opinion is that the ordinary tenant farmer is by no means the most desirable emigrant or the one best adapted for doing pioneer work either in the older or the newer provinces of Canada. As a rule, the English tenant farmer has not been used to the toil and hardship and self sacrifice incident to such a life. Judging by their appearance they are as a class better off than the ordinary Canadian farmer. A large number, if not the majority of them, never do any manual labour themselves, and when you talk to them of going to Canada, the first question they ask is if labour is not very hard to get and very dear out there, showing that their idea runs in the direction of employing others. Large numbers of tenant



farmers in this country have from one to ten thousand pounds invested in their farms, and are in every sense of the word, "capitalists." And in his report says another class will be more desirable, such as the class that means industrial competition. My reason for asking is this, that Mr. Jury, when in this country, all along was opposed to importing labouring men and such people because they would compete with the labouring men in towns and cities. He has evidently changed his views, and is it in that class he is working now?

A. He has no such instructions; in accordance with the instructions of the Department he has to work for the purpose of bringing out the agricultural class, but not to work with the industrial class to bring them out in competition with the labour market. No one of our agents has such instructions. His positive instructions are to confine himself to the agricultural class. The statement of Mr. Jury as to tenant farmers is borne out by Mr. Preston to a certain extent. He says the tenant farmer is one of the squires of the place, and to bring him out to the West would not be productive of good results, and to that extent he is not a good man to bring out because he would not be satisfied.

#### REPORTS UPON NATIONALITY OF IMMIGRANT ARRIVALS, AS DECLARED SETTLERS.

*By Mr. Clancy:*

Q. I want to ask you when a person comes from the United States do you pass them as persons of all nationalities coming from the United States or separately by what they may claim their nationalities to be?

A. They come in as of the nation of origin.

Q. Always from the United States?

A. When I say that, it probably has to be qualified to a certain extent. A Scandinavian, for instance, who has been living in the United States for four or five years and comes into Canada, may, and probably will, give his nationality as Scandinavian, though he has been living in the States for several years.

Q. You declare that there came from the United States 11,945 settlers, now were there any Scandinavians among these; have you any knowledge of it?

A. Undoubtedly.

Q. What is your prevailing rule; do you class all persons coming from the United States as a rule, as Americans, for the purpose of making up the returns?

A. Unless they come *via* an ocean port. A man who comes from New York through the United States is classified as from the point of sailing, but a man who comes from a starting point in the States is classified as from the States.

Q. There are no Americans coming through ocean ports, I am speaking now of the number of persons you report here as 11,945; is that supposed to be all nationalities, but American citizens?

A. That means all nationalities including American citizens proper. For instance, the native born American will appear in that statement as an American; the German who has lived there for ten years perhaps will give his origin as Germany, but will be included as from the United States.

Q. There are practically four reports embodied in this, namely, the main one, your report Mr. Pedley, Mr. McCreary's report at Winnipeg, and the steamship companies' report; these are the checking means we have on the whole of the general immigration?

A. In that statement, a German who has lived in the United States ten years would give his nationality as German when he comes to Canada.

Q. There are practically four reports embodied in this, namely, the Minister of the Interior, the report of Mr. McCreary at Winnipeg, your report, and the steamship company's report, these are the means we have of checking the whole immigration question generally?

A. There will be the Deputy Minister's report, then my own report which summarizes the whole work of the Department in immigration, then there is Mr. McCreary's report at Winnipeg, and then there is the High Commissioner's report.

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Q. There is the report of the agents of the steamship companies or our agents at Halifax, St. John, Quebec, and Montreal?

A. Yes.

Q. And Mr. McCreary's report at Winnipeg?

A. Yes.

Q. I suppose we may fairly reconcile our accounts having that before us, the number of persons coming in, in a general sense, and what has become of them. I have these in parallel lines here, and I will take them as quickly as we can, and see if you can give us any information. For instance, there were 110 Austrians reported to have landed in Canada, 86 of these were reported by McCreary. Have you any information of what became of the balance?

A. No, they are settled in the older Canada. That is the presumption.

Q. You had nothing beyond presumption?

A. Well we have this. They declare their intention at the port of landing that they are going to settle in Canada, but do not specially indicate Manitoba or the North West; unless they have tickets bought right through; a good many of them go to older Canada, the Germans going to Waterloo County largely.

Q. Do you pay steamship bonus on those?

A. We pay bonus on no one that does not report at Winnipeg.

Q. They are the only ones?

A. They are the only ones.

Q. That is clear is it?

A. That is clear. If we do pay on any others, it is only some that are slipped in.

Q. On French and Belgians in Canada, 274 arrived at Winnipeg, and Mr. Pedley reports 413 as declared settlers?

A. Yes.

Q. How do you arrive at that?

A. That is the difference between those that have arrived at the ocean ports and those that have reported at Winnipeg. The others stayed in older Canada. Some of these are Mr. Bodard's and they have gone to Quebec. I cannot say that I can earmark all these, but that is the understanding in the Department.

Q. That is the presumption?

A. That is the presumption.

Q. But you have no better evidence than that. Now, I will take the Finns, 615 arrived at the ocean ports in Canada, and 179 arrived at Winnipeg. You do not report any of these as declared settlers?

A. I do not report any of which?

Q. The Finns; not under that class. There may be some other heading but you do not report them as Finns?

A. That is in my classification.

Q. Yes.

A. No, these are 'Miscellaneous nationalities' in my classification.

Q. Now Germans; 730 Germans arrived at ocean ports and Mr. McCreary reports 1,405 as having arrived at Winnipeg?

A. Yes.

Q. You report 780 as declared settlers?

A. The 1,400 that Mr. McCreary reports includes those that came in from the States.

Q. Yes, but you have already stated that 11,451 came in from the States, that would be doubling it up if that be true?

A. Oh no, if they came in from the States they would not be included in the ocean port tabulation, unless they came in *via* New York.

Q. Montreal is included in this as well as all the other ports?

A. Yes.

Q. Some of these came in by way of New York. Some came in by rail and by other means, and some entered by Montreal and the other ports.

A. Yes.

Q. Those that came in by American ports and landed in Canada are included in the statement I have made, because, I have taken all ocean ports, including Montreal. Keeping that in view, how do you account for 730 including those from Montreal and those coming by American ports, there were 730 arrived in Canada, and 1,405 reported by Mr. McCreary and you have 780 as declared settlers, which comes pretty close to the arrivals at the ocean ports, How do you account for the difference?

A. The difference between 730 and 780?

Q. No, I am not meaning that, but the difference between the arrivals and Mr. McCreary's reports at Winnipeg.

A. The 1,405 includes those that did not come by the ocean ports, they came from the United States. The 730 Germans that I have classified there are those that came *via* the ocean ports and the 1,405 that Mr. McCreary reports includes all those that came from the States.

*By Mr. Wilson :*

Q. Are they there in addition to those reported?

A. No. It is a case of a German living in the United States for ten or twelve years perhaps without losing his nationality. He does not come direct from the Old Country but comes to Winnipeg from the States.

*By Mr. Clancy :*

Q. Are we to understand then that when Mr. McCreary reports 1,405 Germans, it forms no part of those 11,451 that he reports as coming from the United States?

A. No. Now I will have to take these figures and analyse them if you are going to take them from your calculations.

Q. You are the inspector?

A. Well, I am the Inspector, but you have figures there that you have made up and which I have not inspected, and I would like to find out what the details of your tabulation are before I can answer.

Q. There is another matter. Why are they not all reported as declared settlers instead of only 780?

A. They are included in the United States, they are from there and the 11,451 settlers reported coming from the United States include the Scandinavians and Germans and all others who started from the United States.

Q. Mr. McCreary gives 1,133 Scandinavians, in addition to that he gives in his report from the United States 11,945, but he reports under the head of nationality that there were 2,233 Americans and in your report you say that there were 11,945 came from the United States?

A. He gives in his report that so many of these people came from the United States and reported at Winnipeg, but they came in at other points as well, some two or three thousand came in at Portal und Coutts, that are not included in his statement.

Q. I am following this statement, that would make the thing worse. He reports so many landing at Winnipeg, there are 730 landing at ocean ports, and you report the declared settlers at 780. How do you account for that, McCreary having made that report of 1,405 and you give the declared settlers at 780?

A. The Germans that came in from the United States, where the United States is the starting point, would be included in the Americans that came over, the 780 that I put in my statement, is those that came in *via* these ports, and 50 or 60 *via* Winnipeg that came straight from New York.

Q. You will see that Mr. McCreary reports 1,405 Germans landing at Winnipeg and he reports of all classes presumably outside of that, 2,233 Americans.

A. Yes.

Q. I am trying to reconcile these details to see if we can account for these people who have come in here?

A. Well, I just want to see where that is. We will have to take that total first showing whether he includes in that 1,400, those who came in *via* ocean ports or direct from the States. That is where the apparent conflict of figures arises.



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*By Mr. Wilson :*

Q. Can you give us that information ?

A. I think I can show you from the statements here, that, as I think, we have copied McCreary's figures entirely. He speaks of Americans as immigrants from the United States. I may not have it here but I can get the classification. At what page of Mr. McCreary's report, Mr. Clancy, does he make that statement ?

*By Mr. Clancy :*

Q. Well, you will find that commencing on page 106.

A. Yes.

Q. Perhaps I might be permitted, or you might read it, Mr. Pedley. Read on page 106 ?

A.

WINNIPEG, December 31, 1899.

FRANK PEDLEY, Esq.,  
Superintendent of Immigration,  
Ottawa.

SIR,—I beg leave respectfully to submit a report of the operations of my office for the current year, together with the reports of other officials connected with the work of immigration in Western Canada.

It will be seen by a table submitted herewith that the arrivals at this point sprang from a total of 4,198 in 1896, to 27,857 in 1898, supplemented by large incomings by waggons and lines of rail west of Winnipeg, amounting on a fair estimate, to 5,571.

Q. Now, have you any information that there is anything more than a vague estimate when Mr. McCreary says that ?

A. Yes. I have the United States figures here from the different points. Of course there is this to be borne in mind by the Committee, that Mr. McCreary is dealing entirely with the arrivals at Winnipeg and such as might be reported to him by local agents, but he cannot deal with the entire movement, simply, because he has not the sources of information at his command.

Q. Has any one else ?

A. He could not deal with the Lake St. John and Rainy River district, &c.

Q. He is dealing with the North West and Manitoba and therefore has nothing to do with Lake St. John. Has anyone else that information ? McCreary says, "on a fair estimate." The officers at the crossing point will have information as to that particular crossing point.

Q. Is the Department in possession of that information now that induces Mr. McCreary to make that statement ?

A. Yes, I gave the statement here in my first or second day's evidence. We made up the 11,545 coming from the United States and included the number that Mr. McCreary gave as landing at Winnipeg, and then added to that the figures from the reports from different points.

Q. Are there such reports as appear in this general report ? The reports you rely on, are they as here ?

A. They will be given in part, I do not know entirely. He made up the detailed reports from the officers of the Department. He will reach that out of the arrivals at Winnipeg. For 1899, they were 4,087 from the United States.

Q. From the United States how many ?

A. 4,087.

Q. That is at Winnipeg, the total arrivals ?

A. Yes.

Q. Is that the total arrivals at Winnipeg in 1899 ?

A. From the United States.

Q. Where do they come from ?

A. They come from the United States.

Q. What was the total arrivals from the United States?

A. Reported at Winnipeg?

Q. Yes, from the United States.

A. At North Portal, 2,000.

Q. North where?

A. Portal. It is on the Soo line running from St. Paul to Portal and landing a little west of the Manitoba boundary.

Q. Do you get information regarding the number of persons that arrive at Winnipeg from the United States from McCreary?

A. Yes.

Q. Now, from whom do you get information from North Portal?

A. We get the information from North Portal from April 1, from an officer of the Department, Mr. Rankin, who was on the trains running between North Portal and Moosejaw.

Q. Is he there now?

A. He is at Moosejaw unless put at something else by Mr. McCreary within the last week.

Q. Was he on all the trains?

A. On all the trains in the busy season, starting from January 1 to the beginning of April last year.

Q. Has he sent in a report?

A. Yes.

Q. Does he give the dates that they came in?

A. He is supposed to keep track of every soul on board. His record will show that he has detailed information of every passenger on that train unless he knows a man. For instance if he met me he would know who I was, and would know I was not coming in as a settler, but if he met you on the train and did not know you he would ask you if you were a settler.

Q. Does he report everyone that comes in?

A. He keeps a record, and that can be obtained from Mr. McCreary or from himself, at any time.

Q. Well, now, assuming that the number is correct, you said that you had in some part of your evidence accounted for these parties, for these 44,543 who came in as declared settlers?

A. That is the total immigration.

Q. As declared settlers in some part of Canada?

A. Yes.

*By Mr. Wilson:*

Q. At page 9 of your evidence of May 4 you say: "Out of the total travel in and out of Manitoba and the North-West Territories, of 127,281 people, the Department, according to the railway returns, is prepared to vouch for 38,757 who remained in the country."

A. That is from the Conductors' reports; they report to us, and I consider that pretty good evidence. I know it may not be considered official, because they are not officials of the Department, but they work in conjunction with our officials.

*By Mr. Clancy:*

Q. But have you no better evidence than the mere slipshod evidence of Conductors who are not paid for doing the work?

A. I say that is one of the collateral evidences.

Q. Well, if it is collateral evidence, give us the real evidence?

A. Southern Alberta, including Coutts and Pincher Creek, 1,000.

Q. One thousand, the even number; who makes that report?

A. That is reported by Mr. Cottingham, the Dominion Lands Agent at Lethbridge, and also confirmed by Mr. McGrath, the manager of the Alberta Irrigation Company.

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Q. Is he an official of the Department?

A. No, Mr. McGrath is not an official, but some few years ago they made an arrangement to irrigate southern Alberta along the line of the Galt Railway and to work in conjunction with the Department in bringing in people from the irrigation district in the Western States.

Q. You could give us these reports, I suppose, including Mr. McGrath's?

A. Yes, I think we could. I had it verbally from Mr. McGrath when I was out there last year, and I think we have a letter too, and you will find it also in Mr. Cottingham's report.

Q. Mr. McGrath was not employed to get this return?

A. No, but he is a man thoroughly reliable and I will believe his word.

Q. He says 1,000 came in; has he a record or does he speak off-hand?

A. Yes; they own the railway.

Q. So these are Conductors' reports the same as the others?

A. Yes, Conductors' reports; I think I have the Conductors' reports here.

Q. I do not want the Conductors' reports: I never thought them of much value in the past nor now; they are only collateral evidence.

A. If there was considerable difference between their reports and the other evidence we have, it would be a matter of suspicion, but where there is a general consensus of opinion I think they are good evidence.

Q. Now you might continue with those who came in?

A. I am dealing from this on with those who drove in with waggons. Emerson, 198.

Q. Who kept accounts of these?

A. Customs entries, the customs officers.

Q. 198 heads of families, or the whole?

A. 198 souls. Gretna, 683; Morden, 162; Crystal City, 34; Killarney, 97; Deloraine, 101; Lethbridge, 363; Fort McLeod, 28; St. Mary's, 377; Brandon, 46; Carberry, 20; Virden, 3; Neepawa, 97; Portage la Prairie, 158; Prince Albert, 11; Maple Creek, 27; Regina, 433. Now then, that finished those who came by waggon and rail.

Q. Now, how many of those driving in are returned?

A. Those from Emerson to Regina, inclusive. Then, there were 906 in the Lake St. John district, 227 in the Rainy River district, and in the Lake Temiscamingue district and Montreal there were 973.

Q. Now, you have 906 coming in through the Quebec and Lake St. John Railway; who kept an account of those?

A. The Lake St. John Colonization Company, who reported to us on the request of the Department. I do not think it is in the report of the Department because it came in too late, but we have it.

Q. Is that a Conductors' report?

A. No, it is the report of the Society, which gives the total report of the number of people handled by them during the year and specifying the number from the States.

*By Mr. Wilson:*

Q. The Lake St. John brought in from the States 906?

A. Yes.

Q. And the Repatriation Society of Montreal, 973?

A. Yes, 973.

Q. T. O. Currie sent to the Rainy River district, 284?

A. No, T. O. Currie says that out of those he sent, one family went somewhere and 32 to Rainy River.

Q. It does not say how many people?

A. No.



*By Mr. Clancy :*

Q. Now, the Lake St. John Railway Company report coming from the United States, you say, 906 ?

A. Yes.

Q. Do they report all these as being settled in the St. John district ?

A. Yes, up in the Lake St. John district.

*By Mr. Wilson :*

Q. He (T. O. Currie) does not say how many souls ?

A. Yes, Mr. Currie says that from the State of Wisconsin he sent 284 people, and then he goes on further to say that 32 families of these went to Rainy River, and the balance went somewhere else.

Q. The total of souls ?

A. I say that 32 families do not represent the 284 souls ; that is where the point of distinction has to be drawn.

*By Mr. Clancy :*

Q. I was going to suggest to Mr. Pedley, so as to finish next sitting and get the information easily, to ask him to take up the number of declared settlers, 44,543, leaving out of course the settlers from the older provinces that have gone there, I mean outside of Canadians those who are supposed to be foreigners, and leaving out what appears to be an overlapping of 720 homesteads, and what appears to have been taken up before and accounted for from all these sources he has given us, wag-gons and other entries, producing the information in each case ; we will take for granted the collateral proof of conductors, at next meeting, so that we could close. In other words, we desire to have some reasonable account of what became of these settlers.

*By Mr. Wilson :*

Q. I would just like to ask, Mr. Pedley—I suppose you have corrected this evidence that is brought here—“as soon as he passes the boundary line the bonus is payable whether he settles or not ?” is the question, and “whether he settles or not” is your reply ; is that correct ?

A. Well, I suppose that answer must be read in the light of the previous questions ; what I meant was that if between the time the settler reported at the boundary line and the time the account was about to be paid, we ascertained the agent was not entitled to the bonus, he would not get it, but as a rule, the bonus is payable when the certificate is taken up.

Q. I suppose you get a report ?

A. As soon as the certificate is taken up the bonus is payable, but it is not paid by us until we get the report from the railway company.

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, June 6, 1900.

The Select Standing Committee on Agriculture and Colonization met this day at 10.30 o'clock a.m.; Mr. McMillan, Chairman, presiding.

MR. FRANK PEDLEY, Superintendent of Immigration, was present at the request of the Committee, and continued his statement as follows:—

DEPARTMENTAL CORRESPONDENCE WITH AGENTS, AS TO SENDING IN WEEKLY REPORTS.

There are several matters that were left unfinished at the last meeting. I now lay before the Committee the correspondence with Messrs. Rogers and Crawford *re* the furnishing of their diaries. On November 29, 1897, Mr. Lyndwode Pereira, the assistant secretary of the Department, wrote the following letter which was sent to M. V. McInnes, Detroit; J. S. Crawford, Kansas City; Dr. T. A. Brisson, Montreal; Rev. C. A. M. Paradis, Verner, Ontario; Rev. J. H. Brousseau, Maskinongé, Quebec; and Rev. O. Corbeil, Montreal:—

DEPARTMENT OF THE INTERIOR,  
OTTAWA, November 29, 1897.

SIR,—Referring to the circular which was addressed to you on the 29th. ult. instructing you as to the use of the diary form supplied by the Department, the Superintendent of Immigration desires me to say that he is greatly surprised to find that you have paid no attention to the instructions contained in that circular and he would be glad to have an immediate explanation from you in this regard. He wishes you also to see that these instructions are carefully observed in the future.

On November 3, 1897, Mr. Crawford wrote from Burlington, Mo., to the Minister of the Interior, as follows:—

SIR,—Yours of the 29th inst. received *re* diary returns and in reply beg to say that I left for the North West when Mr. Smart left Omaha for Ottawa, and returned about two weeks since. On way down I had only a short time at Kansas City office, arriving there in the evening and leaving early next morning so that I could arrive at Yates Centre in time for advertising a Saturday meeting, so that did not have time to go over fully receipts at office while away. I presume forms were there and I have objection to using them if it be necessary. In my form of work which has dealt only with a street meeting in a county seat, in my dodgers sent Department and list of clubs organized at meetings, always forwarded as quickly as copies of lists can be made a week following, I presumed I was fully accounting for time. I also explained in detail the time requirements of this class of work to make as plain as possible my weekly work is as follows:—If not too far from office at Kansas City I am there part of Monday and Tuesday, it takes my time to send literature and answer correspondence, then not later than Wednesday I go out to some county seat and select place for meeting, then it takes part of a day to get out dodgers, arrange for ads. in the papers, hunt up Canadians and Englishmen and circulate dodgers as soon as out, then to cover the county I mail a number to all post offices in the county Cream Stations, then Thursday morning I am at the adjoining Creamery to talk with farmers as they arrive and send dodgers all over the county, then in the afternoons talk to farmers on the streets, send out dodgers and arrange for them to attend meeting on Saturday. This work continues up to meeting time when I am supposed to have the county well advertised and a considerable interest aroused in meeting. I do no other work except mails, the meetings are intended to do the rest of the work as I cover the county with books, organize a Free Land Club which is intended to continue the work in my absence. This street generally takes from two o'clock to 4.30 and sometimes 5 o'clock. I complete arrangements for future with the Res. M. and Secy. who is the agent for the county; this club announce their future meetings from my stand; is intended to be continued as an investigation organization club for those wanting information free homes. As soon after as I get business through if profitable I get train out going to Kansas City, and if no train, lay over until Monday. This form of work takes my whole time and is repeated. I have appointed no agents in this State since coming here for the reason that it will interfere with this class of work, and further, looks to me to be a waste of time and money as if railway agents be used their interests are always with their companies, all of whom own land, and are required not to engage in any other work but accident ticket work. I do not say that under other circumstances agents generally appointed would have no value, but here the people must know about the country before any removals can take place. So far as I can see yet I can do more work at a two hours street meeting than I can do in three months any other way open to me yet. All matter of questions and doubt are settled and those interested in the country are easily picked out and general information given which could not be given any other way, however if you decide on any other way to be adopted would be

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glad to know, as the weather may be so that I may have to take halls to which it is difficult to get the people. I do not underestimate keeping up ads. in leading papers with work and full attention to this part of the work. If you will be in office next week or week after and will commence to keep as suggested. If you have large maps or anything else good for street or hall meetings would be glad to have. I not only adopt this style of meeting but wherever I find an assemblage of farmers such as auctions in my office days, I work in a little talk, hoping this will be satisfactory, but if not to say also what you wish. I took risk advertising Klondike in last dodgers as I know route, now if not right please say so.

In reply to this letter I wrote Mr. Crawford as follows on December 14, 1897:—

SIR,—In reference to your favour of the 3rd inst., I beg leave to say that regarding the keeping of a diary the work that is being done by you is one which the Department should like to have a weekly record of, just as well as that done by other agents. It is only from records such as these, gathered from our agents, each of whom will differ in his work to a greater or less extent, that the Department can gather a measure of reliable information upon which to improve the method of conducting immigration work from time to time. On this account, I desire to ask you once more to kindly furnish us with a weekly report of your work.

Then on May 5, 1898, Mr. Pereira sent out the following circular:—

The Superintendent of Immigration desires me to say that he observes that the instructions about filling up and sending in weekly diary sheets are not being carefully followed by all of the agents and others engaged in the immigration service. He wishes me to draw your particular attention to this matter.

A copy of this circular was sent to Mr. Crawford and also to Messrs. Currie, Brisson, Brousseau, Bennett and Markham.

I sent out the following circular on October 25, 1898, copy of which went to Mr. Crawford:—

SIR,—I beg leave to call your attention to circular of May 5 of this year, of November 29 of last year, and of October 29 of last year, in which you are requested to send in weekly a diary filled in as per forms mailed to you from time to time when required. I may say that the fact that you have not attended to this work regularly is one which has interfered considerably with the systematic working of this Department, and at the same time has prevented us from knowing from week to week what is being done in detail by the various agents of this Department, but perhaps the most serious feature of the matter is that having been requested to fill in these forms and mail them to the Department weekly the request of the Department has been practically ignored. It would require very little time to keep such a record from day to day, and certainly very little trouble to mail it to this office. Unless the request and instructions of the Department are complied with it will be absolutely useless for us to try to continue immigration work successfully. This diary should state not merely that you were at such a place on a certain day but should give some particulars as to what you were doing at that time. I trust hereafter these reports will be promptly mailed to the Department.

On October 28 of that year the following circular was sent to all the salaried agents in the United States by the Assistant Secretary of the Department:—

SIR,—In order to remind you again of the requirements of the Department in that behalf, and to place you in a position to comply with such requirements, a fresh supply of diary forms is being sent you under another cover, and I am to say that it is the desire of the superintendent of immigration that you should make a regular practice of filling up one of these forms every Saturday night and mailing it immediately to the Department. It is the intention to strictly enforce this requirement in the case of all persons engaged in immigration work who receive a regular salary or allowance from the Department, in order that the superintendent may be in a position at any time to state, if asked, exactly where every man engaged in the service is, and what he is doing. The superintendent is not in that position at the present time, and it is most desirable that he should be for the sake of the agents themselves as well as of the Department and the general interests of the service. Only a few of the agents have been at all careful in this matter in the past, but it is hoped that from this time forward all will make it their duty to use the prescribed form with the regularity herein enjoined, and to include in their entries on the form full and specific information as to their operations from day to day. A number of copies of a second form will be found enclosed with the diaries. One of these should be carefully filled up and sent to the Department by each agent on the last day of every month, in order that the actual results of his work may be seen. In the case of agents residing in Canada the term "your district" will apply to the part or parts of the United States in which they carry on their operations, whether personally or by letter.

Mr. Crawford wrote to me from Kansas City on October 28, 1898, as follows:—

DEAR SIR,—I have your circular letter *re* reports and will say that I have no desire whatever to ignore instructions. With the class of work which has occupied my attention, hoping for its success, I have kept you posted or by giving you each week's result in a county club (Free Land) report as promptly as possible after meeting, which gives the result of four days' work at each county seat. Then my expense bill gives my movements fully as railway and hotel exhibit fully every move. My kind of work may or may not be the best kind of work, but so far as I am aware I am unable to see any way I can get such results in advertising whether other results follow or not. I wrote you giving the manner of spending the weeks, giving



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the first two or three to office here which for travelling correspondence, getting off delegates and other work seemed necessary. I have now a pretty extensive acquaintance in those two states and am sure in no other way could I have reached this, then as to results not yet extensive, I think should end as experiment if March and April do not exhibit considerable more. I have been instructed by Mr. White to go over this work which I am now at, not forgetting to do new work where profitable, and this without giving the time so much to advertising as in the past. I expect to continue to send the club organization reports, as by this the books are distributed free and new interests are aroused. Have asked that my work be inspected and glad to know of late appointment of Mr. White, who I feel sure should spend a little time with me.

In reply to this I wrote Mr. Crawford on November 4, saying :—

SIR,—I beg to acknowledge the receipt of your letter of the 28th ult., and to say in reply that it is the desire of the Department that you should send in weekly diaries giving particulars connected with your work in accordance with circular letters of the 25th ult.

Another circular was sent out by Mr. Pereira on October 18 last to a number of our United States and Canadian agents, and a copy of it was sent to Mr. Crawford. It is as follows :—

SIR,—The Deputy Minister has learned with surprise that the instructions of the Department in the matter of weekly diaries are not being carried out by the agents of the immigration branch. Stringent circulars in this regard have been sent out from time to time, but very few of the agents have paid attention to them. It is absolutely necessary that all instructions issued by the Department to its agents should be promptly and fully obeyed, and I am to make it quite plain to you in the present instance that if any agent neglects hereafter to fill up one of these diary sheets every Saturday night and to mail it immediately to the Department as instructed in the circular of October 28, 1898, he may be summarily dismissed.

Again, on January 24, this year, a circular was sent out by Mr. Keyes, the secretary of the Department, to all the salaried agents in the United States and to C. O. Swanson, Dr. Brisson, Rev. R. A. Burriss, Rev. M. Blais and Father Gouin, as follows :—

SIR,—As it is observed that very few of the agents are complying with the repeated instructions of the Department in the matter of weekly diaries, I am to inform you that it has now been determined to withhold the salary of any agent who hereafter makes default in this respect. The accountant will, therefore, at the end of each month, hold all agents' salary cheques until he receives notice from the Superintendent of Immigration that the diaries of the payees have been duly received, and that they are satisfactory.

On March 2, 1900, Mr. Keyes wrote to Mr. Crawford personally this letter :—

SIR,—I am directed to inform you that no diaries have been received from you as yet for the month of February. Please send them in immediately, and report why not forwarded at the end of each week according to instructions.

Mr. Crawford's reply to this was addressed to me and dated from Kansas City on March 6. He says :—

DEAR SIR,—Replying to yours of the 2nd inst. *re* diaries, my account for February gives my whole movements for the month out of my office. Only go out for meetings. In some cases on account of bad weather and roads forced to withdraw.

Mr. Keyes then wrote to him on March 13 as follows :—

SIR,—I am directed to say that your letter of the 6th inst., is not a satisfactory reply to the circulars which have been sent you from time to time with regard to diaries. These weekly diaries and the forms furnished for statements of your disbursements are intended to serve distinct and separate purposes, and the one cannot be substituted for the other or made to do duty for both. Please understand that the instructions regarding diaries are imperative.

On May 11, I wired Mr. Crawford as follows :—

Parliamentary Committee demands production your weekly diaries from July 1, 1898 to June 30, 1899. Must have these at once.

I again wired Mr. Crawford on the 2nd of this month as follows :—

I wired you the 11th ult. for diaries July 1, 1898, to June 30, 1899. Why are they not here? Must have them by Wednesday morning,

And in reply, I received the following wire the same evening.

Crawford out of city ; will let you know Monday. (Sgd. Ass't.)

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Mr. Rogers received copies of the circulars which I have read and in addition I sent him a similar wire on May 11 to that sent to Mr. Crawford. In reply I received the following letter from Mr. Rogers:—

WATERTOWN, S.D., May 19.

DEAR SIR: On my return to Watertown I received your telegram asking for weekly diaries from July 1, 1898, to June 30, 1899. The message was phoned to me at Redfield—from which place I wired you—but did not understand exactly what was called for until I saw it. In reply I beg to say, I kept no weekly diaries and have made no weekly reports. You will recall that on the occasion of your visit, also that of Mr. W. J. White, this matter was discussed. The reasons then stated, and which are still true, were briefly these: (1.) My monthly statements account for every dollar of expenditure, how, when, and where. As to whether the time and money thus spent were profitably used, I need only point to the results of my work, which the Department has pronounced "quite satisfactory," and of which I am pardonably proud. Put into a sentence it is this who have "sold out and are going somewhere." (These must be seen after or they will be side-tracked by some of the many land agents from other states.) Besides attending to the large correspondence. Scores of times have I reached Watertown at 6 or 9 o'clock and worked until one or two in the morning. Had I less to do or less important work on hand, or if the interests of the work were thereby promoted such reports might be in order. But under the circumstances my honest conviction is that it would be a useless waste of time.

I replied to Mr. Rogers on May 28 as follows:—

SIR,—I have your favour of the 19th inst., with reference to furnishing to the Department weekly reports of your work. I am a little surprised at the position taken by you in the matter as there has been enough correspondence sent from here to the agents to establish, I think, very clearly what the Department thought was necessary to be done in forwarding information regarding their movements from time to time. It is not a question whether these reports are any good or not. That must be decided by the Department. I may say, however, that they have been considered of some use so far where they have been received. So much so that a committee of Parliament has asked for them from each of the agents. Fortunately we have been able to give them, with two or three exceptions. It certainly would take very little time to fill in the blank space on the diary forms showing each day's work. If you have no record of what you are doing from day to day since the receipt of my telegram or since the end of June, 1899, I suppose it will be impossible to get it now, but from this time out I must insist that these reports be sent in.

(*Telegraph*).

DEPARTMENT OF THE INTERIOR, OTTAWA, June 2, 1900.

J. S. Crawford, 214 West Ninth Street, Kansas City, Missouri,

I wired you 11th ult. for diaries July 1, 1898, to June 30, 1899. Why are they not here. Must have them by Wednesday morning.

(Sgd.) FRANK PEDLEY.

That concludes the file of our correspondence with these two agents up to the present.

#### REPORTS OF WORK FROM AGENTS IN EUROPE.

I received a letter from Mr. Clancy asking for a statement showing the number of days travelled by each of the agents in Europe during the year 1899. The reports that we have received from our European agents are not in diary form as are those we received from the United States agents. Their reports are monthly reports sent to the High Commissioner and by the High Commissioner forwarded to the department. The system which is in vogue in the Old Country is one which has been formed and carried out very largely as would appear best in the judgment of the High Commissioner, at least we have not interfered with that system, so that what I can report to the Committee this morning is not exactly the same as I can from the United States, but I think is sufficiently full to enable the Committee to form a pretty good idea of what the Old Country agents are doing.

We have from Mr. Preston a report showing that he visited the following countries, travelling 18,000 miles: England, Scotland, Ireland, Wales, Russia, Finland, Norway, Sweden, Denmark, Germany, Austria, Hungary, Holland, Belgium and France. That would be from the 1st of April, 1899, to the end of the year; he left here on about the 1st of March and it would take him several weeks before he would start out on these visits.

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*By Mr. Clancy :*

Q. He gave that in his evidence, I think?

A. Yes, most of this information is in the annual report. He also visited the following villages in Galicia, Hungary: Cracow, Lemburg, Tarnopol, Beroywisca, Ostrow, Bucniow, Zloiska, Gryzbowice, Dublang and Malechoir.

Mr. Jury reports that he attended either as a visitor or as a lecturer, the following places: Leeds, fat stock show; Denton, lecture; Shrewsbury, lecture; Bebington, lecture; Chorley, lecture; Rainsford, lecture; Nelson, lecture; Hull, to visit some people going out in the spring; London, two lectures; Red Hill, lecture; Norwich, lecture; Cockermouth, lecture; Denton, lecture; Liverpool, lecture to students of commercial class on the industries of Canada; Bakewell, lecture; Kettering, lecture; Hough, lecture; Swansea, lecture; Warrington and Southport, visited steamship agents; Ashton, Staley Bridge, Mossley, Eccles, Patricroft and Manchester, visited the steamship agents; Chester, lecture; Norwich, fat cattle show; Bury, lecture; Waterloo, a suburb of Liverpool, lecture; Birmingham, fat cattle show; Nottingham, goose fair; Kettering, visited two families going to Manitoba; Hull, fair; Washington, visited a family going to the North West Territories; Lincoln, Grantham and Newark, visited steamship agents; Lancashire, Rhye and Llandudno, shows; Manchester district, visited two parties intending to emigrate; Edinburgh, assisting Scotch agents at Highland show; Louth, Lincolnshire show; Hull, Yorkshire show; Liverpool, Royal Lancashire show; Berwick, seeing a gentleman thinking of going to British Columbia; Newcastle-on-Tyne, visited a young man who has since gone out; Capheaton, visited a tenant farmer thinking of going out; Blackpool, seeing a man going to invest capital in farming in Canada; Manchester and Salford, Working Boys' Home; Preston, steamship agent; Birmingham, visit to a child saving home; Sheffield, met two families thinking of going to Canada.

Q. He does not seem to have met many that had made up their minds to come out?

A. Well, he just states what I say. Bristol, met Mrs. Foster of Bristol Emigration Society and Mr. Whitwill and Mr. Chaffey of Bristol Industrial School; Cockermouth, visit to Cumberland County Industrial School; Chatham Hill, Manchester, visit to Boys' and Girls' Home; London, three lectures; Doncaster, lecture and visited steamship agents; Conisboro, lecture; Gainsborough, lecture and steamship agents; Liverpool, child saving institutions; south of Wales, two lectures; Lincoln, visited two families since gone to Canada; London, three lectures and visit to Dr. Barnardo, Rev. Dr. Stephenson and Miss Macpherson's homes for rescuing children; Manchester, emigration business; Derby, two lectures; Lancaster and Penrith, steamship agents; Kendal, lecture; Todmorden, lecture; Southport, Ormskirk, steamship agents; Sheffield and Leeds, emigrants intending to invest in Canada; Manchester, inquiries about a market in Lancashire for wooden skewers used in packing bales of cotton; Leeds and Bradford, to obtain information in reference to the woollen trade; Newton Heath, visit to a man who is thinking of going to Canada; Caerwys, visit to a man who sails this month; Masboro, lecture; Rotherham and Sheffield, visit to shipping agent; Manchester, to visit a man who sailed; Wigan, visit to shipping agents; Leicester, lecture and visit to shipping agents; Bury, lecture; Carlisle, visited two men coming out this spring. Mr. Jury mentions that part of the time was spent in the office giving information and during the time that Mr. Mitchell, who is the clerk in charge there, was on his annual leave of absence.

Q. He does not give the days travelled there at all?

A. No, his report goes into the High Commissioner saying "During the month I visited the following places," and his monthly statements will show just about what I have read here. Of course this is a tabulated form; his reports are in narrative form.

Q. That covers the year?

A. His reports cover the year.



Mr. H. M. Murray of Glasgow, the agent in charge of Scotland, reports that last year he visited the following places in the interest of immigration: Nairn, Keith, Dingwall, Inverness and Lockerbie, all in Scotland; Penrith, Whitehaven, Morpeth and Hexham, in England; again in Scotland, Dunlop, Dumfries, Glasgow, Greenock, Aberdeen, Ayrshire, Castle Douglas, Kilmarnock, Ayr, Hamilton, Barrhead, Paisley, Sterling, East Killbride, Cupar in Fife, Dalkeith, Dunfermline, Edinburgh, Brechin, Strathner and Elgin; and Durham and Belford in England. This is the report from Mr. Murray.

Mr. John Grant, Parkhurst, Dumfries, Scotland, reports that he visited the following places in the interest of immigration and addressed thirty meetings in the counties of Dumfries, Kirkcudbright, Wigtown, Ayr, Peebles, Selkirk, Roxborough, Berwick, Cumberland and Edinburgh.

Mr. Thomas Duncan, at Carnoustie in the north of Scotland, reports as follows: Banffshire, Aberdeen, Kincardine, Forfar, Perth and Fife, visits to people who had written for information regarding Canada; Elgin, to take over government goods in late Mr. Stuart's possession; visited the agricultural shows at Cupar, Fife, Dalkeith and Dunfermline; at Edinburgh to help at Highland Agricultural show; Brechin, Forfarshire show; Aberdeen, Royal Northern show; Elgin, Morayshire Farmers' Club show; Mugle, Stormont and Strathmore show; Keith, Banffshire show; visited shows at Duns and Kelso; visited the booking agents at Cupar, Perth and Forfar. He visited parties wishing for information about Canada in Aberdeen, Kincardine, Forfar, Perth, Fife and Kinross; attended the show at Newcastle town; the horse show at Glasgow; arranged for lectures at Aberdeen, Edinburgh, Dalkeith, Gala-shiels, Kelso and Jedburgh; and attended the Edinburgh fat stock show.

Mr. C. R. Devlin, in charge of the Dublin agency in Ireland, visited the following places: Lisburn, Wicklow, Ballina, Athlone, Castlebar and Stroke town. The above is taken from newspaper cuttings of lectures, as Mr. Devlin's reports do not indicate all the places which he visited.

Q. He does not state there, as the others do, how many lectures he gave?

A. No, those appear not to be incorporated in his report.

Mr. O'Kelly, in Ireland, visited the following places in the interests of immigration. Mr. O'Kelly, as far as I can gather from his reports and from his interviews with the Inspector of European agencies, and I think from some correspondence from the High Commissioner, does not devote himself as largely to lecturing as some other gentlemen, but devoted himself particularly to personal visits and canvassing. Here is the list of places he has visited:

Enniskillen, Connor, Draperstown, Poyntzpass, Bailieborough, Kingscourt, Coleraine, Derry, Portadown, Rostrevor, Londonderry, Belfast, Castlewellsan, Newcastle, Lurgan, Keady, Derrygonnelly, Clones, Killashandra, Belleek, Lisnaskea, Armagh, Markethill, Ballynure, Broshane, Banbridge, Kells, Crossgar, Dundalk, Cootehill, Ballybay, Dublin, Coleraine, Larne, Carrickfergus, Kilrea, Ballymoney, Ballycastle, Magherafelt, Woodburn, Maghera, Tubbermore, Balmoral (near Belfast), Stewarstown, Coalisland, Carriekmacross, Trillick, Ballinamallard, Ballyearry, Sandfield, Stranorlar, Omagh, Strabane, Raphoe, Newry, Clough, Cushendall, Carnlough, Dungiven, Cootshill, Ballybay, Antrim, Armagh, Ballygawley, Dundrum, Hillsborough, Markethill, Glenarm, Ballymena, Tempo.

*By Mr. Macdonald (Huron):*

Q. From what source do you get this?

A. From the reports furnished by the agents monthly to the High Commissioner.

Q. Is it published?

A. I think much of it is in the annual report. Some of the agents in their annual report indicate their work as I am doing this morning; others again summarize their report, and the details have to be taken from their monthly reports.

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*By Mr. Clancy :*

Q. I did not interrupt Mr. Pedley as I had asked for information, but not of the kind he has given. The information I asked for is the number of days travelled by our agents?

A. As I said I cannot give that, I have only the information as to their movements as it comes to the Department. These are taken from the reports of the agents that are on file in the Department.

*By Mr. Featherston :*

Q. You are just giving an answer to the question you have been asked?

*By Mr. Clancy :*

Q. No, I asked Mr. Pedley to give the number of days the agents were travelling if he could, all the European agents, as he has given it for the United States agents, and I understand that Mr. Pedley has substituted that for what I asked.

A. Well, as I told you I am not able to answer the question as it is worded. All I can do is to take the reports in the Department showing the movements of our old country agents and give it to the Committee, if they so desire. They have a different system of classification in their movements, from what we have adopted with reference to the agents in the United States.

Mr. Bodard visited the following places in the interests of immigration:—

Cognac, Boulogne, Beillant, Nantes, Cancale, Salleboeuf, St. Foy, Chateaubriant, St. Malo and St. Germain.

Mr. Foursin reports having made a journey to the south of France, and also to the districts of Marne and Seine and Marne, north-eastern France.

Mr. De Coeli visited in the interests of immigration the following places:—

Antwerp, Montzen, Ghent, Florenceville, St. Remy, Signeulse, Halensy.

Mr. Griffiths reports having visited the following places in Wales:—

Llandgssul, Pembrey, Swansea, Olynderwln, Narberth, Aberdare, Letterston, Whitland, Aberywynp, Llandovery, Blackwood, Carmarthen, Kedwelly, Pontypridd, Pembroke, Swansea, Carnarvon, H'West, Clarkeston, Llwynypea, Carmarthen, Llanelly, Llandyssul, Llandovery, Newport, Bridgend, Talgarth, Rhyl, Conway, Bangor, Narberth, Resolven, Llandilo, Longhor, Neath, Carmarthen, Carmarthen, St. Cleurs, Liverpool, Liverpool, Newport, Balm, Newport, Dolyelly, Aberdare, Bristol, Pembrey, Neath, Pembroke, Swansea.

He also reports having attended as many of the shows and fairs in Monmouth and South Wales as possible.

#### EXPENDITURE IN THE UNITED KINGDOM AND ON THE CONTINENT OF EUROPE.

Mr. Wilson, who is not here to-day, asked me: "Would you have the kindness to give us the following information at the next meeting of the Agricultural Committee: what has been spent on immigration by the Dominion of Canada in the following countries:—Great Britain and Ireland, this is England, Wales, Scotland and Ireland, also what has been spent in Europe for the year." This is the information I have in answer to Mr. Wilson's letter; the Committee will bear in mind that when I am giving these quotations it is with reference to the calendar year, the appropriation that is voted by Parliament and the returns in the Auditor General's report are based on the fiscal year ending June 30, and what I am giving is for the calendar year ending on December 31, so that the statement of expenditure must be taken as approximate.

*By Dr. Macdonald (Huron) :*

Q. That is for the year ending December, 1890?

A. Yes. From January 1, to December 31, 1899.



The CHAIRMAN,—Will Mr. Pedley go over that item by item or will it be handed in?

A. There is just one page here.

In Scotland for agents' salaries, travelling, office expenses, advertising and miscellaneous expenses, \$9,283; Ireland, \$11,034.53; Wales, for the same items, \$3,369.03; England, for the same items, \$11,389.04; on the continent for agents' and delegates' salaries, travelling expenses and office expenses, \$5,965.56; Professor Oleskow, \$1,216.67; continental bonuses, \$13,150; printing and advertising, \$2,383.05; *Paris-Canada*: that is a newspaper published by the Hon. Hector Fabre and for which the Department contributes \$1,000 annually, but for that calendar year we spent \$750; B. Karlsberg, expenses etc., with Mr. Preston, \$174.89; Miscellaneous, \$100. By reason of the expenditure being made for certain items which are distributed over the three or four countries, Great Britain, Ireland, Wales and the Continent it is impossible, so the accountant informs me, to charge up to each particular country the exact amount expended of these items, but I give the items so that you may know what amount has been expended.

*By Mr. Clancy:*

Q. You stated what is paid for continental bonuses, but you have not classified them there?

A. No, that is a question that was raised the other day, and which is still in the same position; we probably can divide it and can classify and distinguish the continental bonuses from the bonuses paid in the United Kingdom.

Q. Well, you have done that already?

A. Yes, but as to the payment of continental bonuses to Germans and Scandinavians and Russians and other nationalities outside of those who come in as Doukhobors, that classification, as I stated the other day, is not at hand.

The following expenditure cannot be dissected, so the accountant informs me; it is as follows:—

British bonuses, \$1,629; Sundry persons, freight, cables, petty cash, etc., \$732.30; Sundry printing, advertising, etc., \$11,255.01; Postmaster General, postages, \$694.39; C. Carter, lecturing expenses, \$27.38; M. Ashworth, typewriting, \$242.26; W. T. R. Preston, salary and expenses, \$4,793.14; Ocean passages, etc., \$75; Sundry persons, miscellaneous expenses, \$200; Total, \$54,724.08.

This is the answer to that.

I have been asked a question as to the number of immigrants sent from the United Kingdom by our agents in 1899, and where these have been located in Canada. This, as I stated at the time, was a matter of which we had no definite record, and I am not able, or we are not able from our records to say the number of individuals that have been sent. We have not been able to trace the movement of the individuals from the Old Country to the work of the agents. That would be an impossibility I think physically, as well as otherwise, for any one agent to be able to keep records showing the number of people who left any district in which he was working, owing to his efforts, because in the Old Country the agent who may be instrumental in persuading people to move to this country by reason of the lectures or other means he may adopt, may not see these people at all after the lecture has been given, or after he has sent them literature or communicated with them, showing the advantages of Canada as a place for settlement. They may go direct then to a steamship agent, purchase tickets and sail for Canada, so it would be absolutely impossible unless we followed every man that came to the country to his destination and questioned him as to how he came here, and then should communicate with our agent after that, and find out if it is the same person and thereby make a close identification between the influences exerted by our agent and the men who come to Canada. I think the Committee will agree with me that there is no system we could possibly devise whereby this could be done, that is to identify each man coming to Canada, if he came directly or indirectly through the work of the agents.



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*By Mr. Clancy :*

Q. You rely on the reports of the steamship companies for the number coming from the respective countries? You mean that if the agent were not able to do the work you have just gone over, you would have to take the report of the steamship companies as pretty nearly the sole information, would you not?

A. No, the information the steamship companies furnish us is as to the passengers booked, and it is verified by our own agent at the port of landing; he counts the heads.

Q. I am commencing at the other side. I can understand when they get here it is not so difficult to keep track of them, because they have come to this side, and our agents in a sense take charge of them, but in the face of the statements you have made you are not able to say how many left each country?

A. They are not able to say very definitely how many left.

Q. But there are definite reports from some of the agents?

A. Our agent in Glasgow, Mr. Murray, states that so many people left Glasgow. If he is down at every outgoing boat and compares the ship's manifest, he will be able to ascertain, the purser on board will know how many passengers are on board.

Q. For Canada?

A. For Canada. The boat leaves Liverpool for Montreal and his manifest will show how many were on board whose destination is Canada and how many whose destination is the United States.

Q. You will get that information in Canada just the same. The information will be brought to this side of the Atlantic.

A. I do not attach as much importance to the statement of Murray, that 1,800 people left Scotland for Canada, as to the statement of the agent at Quebec that 1,809 people reached Quebec whose destination is Canada, for the arrival of so many is of more importance than the statement that so many left Scotland. They may never have got off the boat.

Q. What the Committee want is this. Some of these things it would be perhaps difficult to be very definite in, but generally we desire to have some information through our own agents of the magnitude and results of the work of the very considerable staff we have working over there. I take it from the statement you have made to-day, Mr. Pedley, that they are completely in the dark as to the relation between the number of persons that land in Canada and the number of persons that they have had anything to do with in sending here.

A. They are not completely in the dark because if a person intending to emigrate to Canada, opens up correspondence with one of our agents in Europe, and as a result of that correspondence he leaves and comes to Canada, and then corresponds after his arrival here with the agent, as they very often do, why then, of course the identification can be easily made. But when he knows of people who leave England, Ireland and Scotland, indirectly through the same influence, either correspondence with the Government agents through the perusal of Government literature, or the representations that are made by their friends in Canada, who have been induced to come here by the agents and various other ways through the influence of people who have been in contact with the agents, for the agent is there for the purpose of keeping Canada before the people and must to a certain extent be credited with a share of the work that has resulted in people coming to Canada.

Q. Yes, but he has claimed the whole?

A. No, our agents do not claim the whole.

Q. Take Ireland, where he says that 700 and odd—

A. We claim that so many Irishmen landed in Canada.

Q. Mr. Devlin reports that 700 and odd came from Ireland through the efforts of himself and our staff there.

A. I speak subject to correction, but I do not remember reading in our reports that our agents claim credit altogether for that work. They say they have been working in Ireland during the year and during that year so many people left Ireland.

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Q. Well, so far as you know, Mr. Pedley, our European agents are unable to give any definite information as to the number of persons sent out as a result of the work of each agency?

A. I think it would be impossible for the agents to give the exact number sent to this country through their influence.

Q. Well, could they give it approximately?

A. I am not prepared to say at present how far they could approximate to the number of people. If we were to ask them to do so they might be able to come within a reasonable degree of the number, but we have never asked them for that. The nature of the case is such that it would be imposing a pretty difficult task on the agents to define exactly, or even with approximate exactitude, the number sent out. For instance, nearly every Irishman that comes out leaves Liverpool: he does not sail from Ireland. That would be the difficulty that would confront Mr. Devlin at once. If we asked he would say 'I am not able to put my hand on every man because they do not sail from Dublin but from Liverpool.'

Q. Well, if he knew that fact he could say so and his report would be quite complete, his information would be quite complete, and if he does not do that it means he is not looking after either?

A. No, I don't think so.

Q. If he knows they left any port and left Ireland he could report it?

A. He knows that of the 747 of the total number of people who left Ireland for Canada probable 90 per cent sailed from Liverpool. Now Mr. Devlin would have to be in Liverpool and check them over to know if they had left.

Q. Well now, is there this about it: if the agents are accomplishing something there they must know out of the 700 people leaving that country in a year they must be able to locate the place where they left, that is not a difficult task, is it?

A. No, I fancy Mr. O'Kelly, for instance, or Mr. Webster could find out by correspondence with the localities where they had lectured or visited how many people left there for Canada.

Q. Well now, having said that would you advise our agents to go as far as what could get us that information and instil some of that energy into them which is always necessary to bring about success?

A. I would go so far as to say that the identification more closely of the people and the work has been up before the Department for some time, and I am quite willing to do what I can to bring about a more perfect system of identification. We are doing all we can to bring that about, but the money at our disposal is limited and the question is—work of that kind being expensive—whether it would not be better to spend the money in some other way.

*By Mr. Rosamond:*

Q. I think a good many Irish emigrants leave Moville.

A. Well, there are a good many but these leave mostly for the United States. The reports of our agents are that most of those coming to this country leave Liverpool.

Q. Some years ago I saw a number coming on board there.

A. Yes, and there would be quite a number coming on board now. I have discussed that matter with our agents personally and by correspondence and it disclosed the fact that most of them came from Liverpool.

*By Mr. Wilson:*

Q. That will close what I have to ask about Europe but there is some unfinished work regarding the United States.

A. There is one question that was asked me as to the duties of Messrs. Bodard, Foursin and De Coeli in the year 1899. Now I hope that the Committtee is not under the impression that Mr. Fabre is an immigration agent. He is an old officer of the Government and has been there 25 or 30 years, and the only way in which we are interested is in the contribution of that \$1,000 for the paper which was



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settled by the Government long ago. I turned up some of the old correspondence here and it dates as far back as—it is a great many years anyway.

*By Mr. Macdonald (Huron):*

Q. Who is this agent?

A. Hector Fabre, who is stationed at Paris.

Q. He gets a contribution of how much a year?

A. \$1,000.

Q. For what purpose?

A. For the purpose of getting published in a paper the Paris edition of a paper called *Canada*, Canadian notes, as I understand it, but so far as being responsible to the immigration branch of the Department of the Interior—

Q. When was that contribution first given?

A. That contribution was first given—there is a note here, that it was restored in '94. But it was given some years ago. It appears to have been customary, that is the information I have from one of the officers, for the Department of Agriculture some years before the transfer of immigration work to this Department, to make a straight grant of \$800 to the Paris edition of *Canada*, and this was continued by the Department until the end of the fiscal year 1893-4, when the grant was cut off altogether. On October 11, 1894, Mr. Fabre wrote a letter asking for three things: (1) The payment of his travelling expenses in connection with the Canadian immigration; (2) An allowance for postage, and (3) For the restoration of the grant to *Paris Canada*. The Minister's memoranda on which we acted in this connection reads as follows:—'Sir John and Council agreed that I should make Fabre an allowance of \$1,000, payable quarterly, in lieu of what he asks in his letter.' This has been continued up to the present time.

Q. That was in 1894?

A. This was in '94. And has been continued till the present time. I suppose this would be Sir John Thompson. Mr. Fabre has been an officer of this Government for a good many years and this paper has been subsidized so to say, from the immigration appropriation, but he is not an immigration agent in the ordinary sense of the term. Really the only Government agent we have there is Mr. Bodard. Mr. Foursin was appointed some few years ago and he has an allowance of five dollars a day, covering his salary and expenses. Mr. Bodard has been getting at the rate of \$100 a month and his expenses.

Q. Who is Bodard again and what is he doing?

A. He is the immigration agent, an old official of the Government, who has been there a good many years. His work takes him over into the counties of France bordering on the Belgian frontier. He has been working all the Southern provinces of Belgium and the Northern provinces of France, and he has induced, according to his contention, a great many people to move to Canada, the majority of whom, as far as I can gather from his report, is claimed by him to have settled in the province of Quebec. He has been out here once or twice since I have been in the Department, and spending most of his time in settling the new districts of Quebec.

Q. Have you the figures to show the value of the assistance of these two parties?

A. Since the appointment of Mr. De Coeli, who was appointed by this Government about a year or a year and a-half ago to work in Belgium, it was thought at the time of his appointment that better work should be done in the Northern or agricultural provinces of Belgium, he has been there since that time, and since his appointment to Belgium, Mr. Bodard has confined himself more particularly to the French districts, leaving the Belgian districts almost entirely to Mr. DeCoeli.

Q. How many people came from France last year?

A. In the classification of the arrivals at the port of landing last year there were 400 Belgian and French, roughly speaking.

*By Mr. Clancy:*

Q. There were 480 according to the report?

A. Yes, 480 are reported as having landed.



Q. Can you divide these into Belgian and French ?

A. The classification will not allow me to distinguish between the two, although it can be done, of course, by means of the steamboat returns in the analysis of their manifests.

Q. Some of them do not give it, that is the difficulty. I mean the arrivals given by the agents at either St. John, Halifax, or Quebec. In some cases they have not made any distinction, and in others they have ?

A. I am endeavouring to make a classification as detailed as possible, so that we can tell just what people are arriving there. I think the last system of classification adopted by the Department enables us to practically to do that, although it might not appear in the report for the year 1899. Yes, I have it here. Seventy-seven people from Belgium, then there are 22 given as Flemish people, now the Belgians and Flemish people are the same—one indicates the language and the other indicates the nationality, so you have to add the 77 and the 22 together, which would be about 100.

*By Mr. Macdonald (Huron) :*

Q. That is from Belgium ?

A. Yes, from Belgium. And the French are 336.

*By Mr. La Rivière :*

Q. That is for this year or last year ?

A. For the year 1899.

*By Mr. Semple :*

Q. Does the immigration from France appear to be increasing or decreasing ?

A. The immigration from France does not show very much difference either way. I think Mr. Preston explained that the French peasant is rather a hard person to move.

*By Mr. Rosamond :*

Q. Can you give the cost per head of all these immigrants, taking all the expenses of the immigration agencies, including Hector Fabre, and tell us what is the cost per head to Canada of these 480 immigrants ?

A. That can be arrived at by dissection of the accounts, but, as I stated before, there are some difficulties always in the way, simply because of the expenditure for advertising and literature, and the general expenses which are distributed over the Continent and the United Kingdom, and it would be pretty hard to decide how much would be properly charged to France or Belgium, Germany, Scandinavia, United Kingdom, or other countries. It can be done with a certain reasonable degree of approximateness, but that is about all.

Q. It would be desirable to know whether it was too expensive or not to keep up these agencies ?

A. I am having a statement prepared which will take some time to do, and which will likely come before the Committee or the House when it is ready, but I am not quite sure how long it will take.

*By Mr. Macdonald (King's) :*

Q. Have you a statement of the total expenditure for immigration, and the statement of the total number of immigrants which have come to Canada ?

A. We have a statement of the total expenditure for the year 1899, and a statement of the total number of people who arrived in Canada.

Q. That will give you an estimate as to what the general cost is per head ?

A. Yes, the average cost is from \$8 to \$9 per head. The appropriation for the fiscal year ending June 30, 1900, was \$360,000 and the appropriation for the

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previous fiscal year \$257,000. The two appropriations will necessarily overlap in the calendar year, but I gave a statement here some time ago showing as far as we could do so, about what the expenditure was in Canada, in the United States, and in Europe for the calendar year.

*By Mr. Clancy :*

Q. There is one thing I want to make clear, if you are sure, Mr. Pedley, as to your mode of determining, how many persons came into Canada to remain. They are checked at the ports of St. John, Halifax and Quebec, the arrivals by steamship?

A. Yes.

Q. At the port of Montreal they are checked as persons coming through the United States and landing at New York, the persons coming to Canada by way of New York?

A. By way of New York and Portland.

Q. By way of New York or Portland, yes any of the seaports?

A. Any of the seaports, yes.

Q. Then there is another class at Montreal, I understand, checked as having come by rail or otherwise. Now, there are two classifications in the report at Montreal?

A. Yes.

Q. Perhaps to make that clear I might just give the table:—‘The number of immigrant arrivals at Montreal per ocean travel via the United States ports of New York, Boston and Portland, their nationalities, occupations and destinations.’ That is one of the tables given here. Now, there is another table ‘B’ which shows ‘The number of immigrant arrivals at Montreal from the United States, their nationalities, occupations and destinations.’ Now is the check made on that through the railway conductors or how is it done?

A. That is done by our officer at Montreal, Mr. Hoolahan or his staff.

Q. Does he rely on the conductors for that?

A. No, he relies on the statements of the immigrants themselves.

Q. Then this is not the same as for immigrants coming from the States?

A. I do not know what you mean.

Q. Then as I understand you the explanation of the case is that you have no evidence, so far as the North-West Territories and Manitoba are concerned, of the number of immigrants coming there or persons coming from the United States of all nationalities with the railway conductors, and to determine the number of persons who come in and the number who go out and you take the difference as the numbers of persons that remain in Canada.

A. The conductors do not make that out, we do.

Q. You make the difference when you get the two sides, the number who comes in, and the number which goes out?

A. We take the statement of the conductors, so many *ins* and so many *outs* and the statement of the year 1899 shows so many. We take that statement for what it is worth and as a matter of fact 37,000 odd came into Manitoba and the West over and above those that went out, but this is only one of the sources, of course, of our finding out how many people came in.

Q. You say that of this 38,757 there were 11,945 homesteaders, or as you call them, declared settlers?

A. Yes, of course the returns from the conductors show as well those that came in from the United States and those from the east and west, of the Manitoba boundary on the east and of all Alberta and British Columbia on the west. The conductors’ reports give in fact 37,000 and odd. That number came into Manitoba and the West from all sources.

*By Mr. Featherston :*

Q. Over and above what went out?

A. Yes.

*By Mr. Clancy :*

Q. You return 11,945 as declared settlers ?

A. Coming in from the United States.

Q. Is that over and above —

A. Our statement of the number of declared settlers arriving from the United States is made up from entirely different sources from that of the conductors. The conductors' is a statement which comprehends the movement in and out from Manitoba and the West, from the south, east and west.

Q. So far as showing the actual number the conductors' returns would not have very much weight ?

A. I would not like to say they would not have weight, the report only says that so many went in and so many out.

Q. That is all. It duplicates very much, does it not ? In one return there are 11,945 declared settlers, and then there is another return, namely : the difference between the number of persons who came in and went out on the report of the conductors. One might as well insist on the one as on the other as being correct ?

A. No, it does not duplicate matters as far as we are concerned, if the conductors had not made any report at all, we will still have the 11,945.

Q. Do you count more on account of the conductor's report ?

A. No.

*By Mr. Featherston :*

Q. They have probably located in the cities ?

A. They are scattered all over Manitoba and the west.

*By Mr. LaRivière :*

Q. Does the 11,000 include children and all ?

A. The total number of souls.

*By Mr. Clancy :*

Q. Mr. Featherston suggests they have located in the towns, do you know that they have located anywhere as a matter of information.

A. I suppose Mr. Featherston means by locating that they have distributed themselves at the different points mentioned. Located is a technical term. It is not used so much in the West as in Ontario.

Q. I am not meaning the legal effect of it but I am using it with the meaning he gives it, of becoming a resident in that sense, not in the sense of being located on a piece of land. I am using it in the general sense.

A. There are the statements of the conductors that 38,000 people more have come in during the year 1899 than went out and the statement showing that these people came in and went out at different points in Manitoba and the west both on the eastern, southern and western boundaries of Manitoba and the Territories. I would naturally conclude they have located, in the general sense, all over the country.

Q. It is only, I suppose, a bare supposition on your part ?

A. It is not, because they have not gone out. They must be in the country.

Q. Could they have gone out through any channel and come, say by Montreal ?

A. No, the only channel would be by the Arctic Ocean. They either have to walk out over the international or provincial boundary lines or over the northern boundary.

Q. Well now, let us suppose they came here, suppose these persons landed at Winnipeg and crossed the line, all of them ?

A. Crossed which line ?

Q. Crossed the boundary line between Dakota and Manitoba, the whole 38,000 — I am putting it now for the purpose of getting at the bottom of the question. As



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far as the conductors know, there were 38,757 who did not go out, but suppose these 38,000 took the train and came down here to the city of Ottawa?

A. Yes, they would be counted just as soon as they left the Manitoba boundary at Ingolf.

Q. They are counted going out?

A. We count those going out on all sides (except north to the Arctic); east at the Manitoba boundary, west at the British Columbia boundary, and south at the international boundary.

Q. How do you know these are the same persons or any of them?

A. We do not know, we know there are so many going in.

Q. From the United States?

A. No, from all places; we know the moving population of the country during the year.

Q. From British Columbia and the east as well?

A. Yes.

Q. Then it has no bearing on the immigration question?

A. I don't say that. These conductors' reports are not a new thing.

Q. No, but they were objected to when the Conservatives were in power and I thought then and think even now that those who raised the objection had good reason to do so?

A. But the information on which we base the official returns is not based on the conductors' reports, but we use that as collateral evidence that there is a large surplus of people going in over what came out.

*By Mr. Rosamond:*

Q. Then you count everyone who passes in or out?

A. Everyone who passes over the boundary between Manitoba and the North-west Territories and the district outside, at Ingolf which is the eastern crossing point, or at Laggan on the boundary between Alberta and British Columbia; or at the four crossing points on the international boundary, Coutts, Portal, Gretnat, and Emerson. Now, all the people who go in are counted and those who come out, and the difference last year was 38,000 people coming in more than went out.

*By Mr. Clancy:*

Q. So far as that report may be relied on?

A. So far as the report may be relied on.

*By Mr. Featherston:*

Q. Is it not a fact that Winnipeg and other towns have almost doubled within the last three years?

A. I cannot say as to Winnipeg, but some places have more than doubled. Edmonton has more than doubled and Dauphin, from being a little village of 300, has now about 1,500 people. In the towns along the Calgary and Edmonton branch there are evidences of settlement, and along the Soo line running from Portal to Moosejaw; and the evidence from our local agents shows that there is a great number of people going into Manitoba and the North-west Territories.

*By Mr. Clancy:*

Q. There is a question raised by Mr. Pedley now—Mr. Featherston asks if certain centres of population have not increased. We were not endeavouring to get evidence as to how the cities and towns increased, because the class of people we are paying money for are not supposed to settle there, so that the number of people going in may have a general reference to the growth of the country; but are any of these people, following up the question, settled through these places which have had so vast an increase, the people we are paying money to bring in?

*By Mr. Featherston :*

Q. There is some difference in the figures between 38,000 and 45,000 ; these people are somewhere in the North-west ?

A. There is no discrepancy.

Q. There is some discrepancy there, is there not ?

A. No, our 45,000 are those who came into the country and the conductors report that 37,000 came into Manitoba and the North West Territories ; the conductors' reports are entirely distinct from ours. We say there were 45,000 people who came through the ocean ports and 12,000 who came from the United States, and these go to make up 37,000 who came into the North west. The 11,945 is the number of people who came from the States ; the balance came from the Old Country. There is no discrepancy because the two statements are not comparable in any sense.

*By Mr. Clancy :*

Q. I think it is unfortunate they should have been mixed with the question, because they becloud and confuse it ?

A. The question was raised—Mr. Clancy will understand, being at the previous meetings—when I stated the number of arrivals Dr. Sproule took the ground that we ought to have some evidence as to how far these were correct, and one of the figures he was willing to rely on was, the homestead entries.

Q. That had no reference to the 38,000 ?

A. It is collateral evidence of the number of people who came in, the homestead entries. Many of the people who come in go to the older portions of the country where there is no homesteading.

Q. Can you say of these people, on the mere report of the conductors—since your report is not made up on that, what is your object in introducing that ?

A. It is collateral evidence to this extent, that so many thousand people more came into Manitoba during the year than went out. Some 38,000 people approximately is the difference and if they did not go out they must be there.

Q. Have you the information that they did not ?

A. The conductors' reports.

Q. Have you any other information ?

A. We have the information of so many people reported at Winnipeg, so many came in through the other agencies—I read the figures——

Q. Have you any evidence that these 38,000 people are there except through the conductors' ?

A. We have not the particular figures outside the conductors' reports.

Q. Then you have no evidence—I am not speaking of the 11,000—have you any information other than the conductors' that 38,000 people still remain in more than went out ?

A. The conductors' reports is the only report which gives the exact figures at 38,757.

Q. Have you any reports of your own which supplement that ?

A. Yes, we have our own agents' reports.

Q. Give us those ?

A. Take the report of Mr. McCreary and the agent at Calgary and you will find they bear out that, they corroborate almost entirely the report of the conductors.

*By Mr. Rosamond :*

Q. Oh, I suppose as to the conductors' report that it is an interesting report which bears out the other reports.

*By Mr. Macdonald (Huron) :*

Q. Are not these facts which you have set forth in some of your statements, that during the years '94, '95 and '96 the net entries made in Manitoba and the

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North-West numbered 1,975, and the net entries made in '97, '98 and '99 averaged 4,040, will not these two statements taken together indicate that there was a very large increase of population when the homestead entries increased so largely, and, when you take in connection with that, that the sales made by the companies having land out there during these former years '94, '95 and '96 numbered 719,000 acres sold by these companies, and during the years '97, '98 and '99 these same companies sold 4,042,000 acres, do not these two things together go to show that there was an increase in population.

*By Mr. Clancy :*

Q. Is that to be in the way of a question or a broad statement for Mr. Pedley to agree to?

*By Mr. Macdonald (Huron) :*

Q. I am putting it in the way of a question, if these two facts taken together in regard to the sale of lands purchased, of course by parties going in there, and the net homestead entries during the two periods comprising the three years I have stated, do not indicate that there must have been a very large increase of population in these countries?

A. So far as the homesteads are concerned, I have no hesitation in saying from the official reports and from my connection with the immigration work that the increased number of homesteads will indicate an increase of population. So far as the sales of land by the railway companies is concerned, the natural inference would be——

*By Mr. Clancy :*

Q. We do not want inference at all. You are not giving inferences hereat all. We want to know what information you have that will enable you to state upon your own knowledge that that broad statement Dr. Macdonald has made is true, namely, this : he has stated that there has been so many homesteads or so many acres of land sold, and so on. Do you know all these to be facts yourself?

A. I know it from reports. I have the reports.

Q. Do you know the statement he made was true?

A. I have not made the calculations he has asked about, all I know is from the records——

Q. Then it would be on the presumption that his first statement would be true, and the inference drawn afterwards is as he stated?

A. I am assuming that what he has stated is correct. I have not verified his statement but assume that it is.

Mr. Clancy objected to Mr. Pedley being allowed to give inferences as sworn testimony.

The Chairman ruled that Mr. Clancy having himself several times asked Mr. Pedley to give approximate statements could not object to his giving a reply to Mr. Macdonald's question.

After further argument,

The CHAIRMAN ruled : Dr. Macdonald has made certain statements, he states that the figures he has given to this Committee are taken from the report on immigration. There have been many statements made from the report on immigration, and if Dr. Macdonald chooses to make a statement and then found certain questions on it and asks Mr. Pedley if these statements are in his evidence, that is, that over 4,000,000 acres of land were homesteaded in 1899, and only 700,000 acres previous to it, and that would be evidence of greater increase in population, I think Dr. Macdonald was quite right in asking the questions. I do not think Mr. Clancy has acted fairly in saying that Dr. Macdonald has no evidence when the Doctor states that these things are taken from the reports on immigration. That should be withdrawn or it should be proven that his statements are not correct.



After a further argument,

The CHAIRMAN ruled: I have attended the Agriculture Committee since 1887, almost every meeting, and how many times have I seen gentlemen on both sides of the House, go back into the past reports on immigration and ask about them before this Committee, and I never heard their right to do so disputed before. If a gentleman on either side, to-day, goes back into that evidence, although it does not bear directly upon the immigration of the present year, it bears directly on the immigration perhaps of past years, and may throw some light on this year's, and I think I would be wrong in ruling out such evidence.

*By Mr. Macdonald (Huron):*

Q. Mr. Pedley, is your information based upon the two statements, that the population has largely increased in Manitoba and the North-West Territories?

A. The information upon which the Department bases these conclusions that the population of Manitoba and the North West Territories has been augmented during the year 1899, is derived, in the first place, from the number of people who have gone into the country reported at different points, Winnipeg and the boundary points during the year. The conclusion arrived at by the Department that these people that came in, have come in to the country as settlers, is based to a certain extent upon the number of homesteads entered for, and the Department makes use of the reports of the sales of lands by the railway and other companies as a collateral evidence that these people have remained in the country.

*By Mr. Clancy:*

Q. Has the Department evidence that in the case of these sales of land, they are made to persons coming into the country exclusively?

A. They have not, that I am aware of.

Q. Then I say that for the purpose of showing that plain thing, that certain persons came in during the year and settled there, are but two evidences, as you have stated a moment ago, one the homesteads, and the other the sales of land.

A. Yes we have, we can locate many persons who have bought land from the Canadian Pacific Railway.

Q. How many?

A. I do not know, but there are a large number of letters on file now in the Department from settlers that have been sent in by our agents, who have gone in with considerable capital and purchased land, but we have not tabulated these.

Q. Have you a record of them?

A. We were satisfied with the evidence that a man who left Omaha, say, to come to Canada and had presented his certificate at the boundary line, had come to Canada, and when our agent reported to us this man as purchasing a quarter section or a half section of land—

Q. From the Canadian Pacific Railway?

A. He would have to buy from the Canadian Pacific Railway or the Hudson's Bay Company or some other railway—there are several with land to dispose of—or from a colonization society or from private individuals.

Q. A man goes there and buys from the Government and he is put down as a homesteader; now if he buys from the Canadian Pacific Railway or a colonization society or a private individual there is no record of him?

A. Not as a homesteader.

Q. Now have you any evidence in the Department, of the number of persons coming from the United States or elsewhere who have settled upon lands either purchased or otherwise outside the homesteads?

A. We have no distinct system of keeping that evidence; we may have abundance of evidence scattered through the correspondence of the Department, showing the men that came in and purchased land from the companies which have land for sale, but we have not tabulated them.

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Q. Is it not a mere presumption when you say that a number of these, or a large number, have purchased these lands?

A. Well, it is a statement I make to the Committee on information which comes to me as superintendent of the immigration branch, that a large number of people are coming in possessed of considerable capital, from an agricultural standpoint, and are using that in the purchase of land, but I am not able to put my hand upon a definite statement as none has been prepared.

Q. Can you say any one of them have done so?

A. No, I cannot, off-hand.

*By Mr. Rosamond:*

Q. It would be a wise thing in the future to ascertain that?

A. I think myself it would be a wise thing if these companies would keep a detailed record of their sales, so that the Government on application could be furnished with the information in the same manner information is furnished by our own agents in regard to homesteads.

I have here a statement of the land sales by railway companies which have received land grants from the Government and by the Hudson's Bay Company during last year. The Hudson's Bay Company sold 66,000 acres, amounting in value to \$330,000. The Canadian Pacific Railway Company sold 326,380 acres, of a value of \$1,015,012. The Manitoba South Western Colonization Railway Company sold 90,053 acres, amounting to \$309,708. The Qu'Appelle, Long Lake and Saskatchewan Railway and Steamboat Company sold 45,150 acres, of a value of \$141,353. The Calgary and Edmonton Railway Company sold 25,497 acres, the value of which was \$75,151. The total land sales during the year amounted to 553,075 acres, and the amount received for this land was \$1,871,224.

*By Mr. Clancy:*

Q. Now if there are no further questions on that point, I want to take up some United States matters.

*By Mr. LaRivière:*

Q. Before going on to the United States I would like to go back to the Paris and French question which you were discussing when I came in. You have stated, Mr. Pedley, that there was an allowance for the publication of a paper in Paris, the *Paris-Canada*; does that go against immigration, because that paper is not exclusively an immigration paper?

A. I do not know whether there is any other contribution?

Q. I do not see why that should be charged to immigration exclusively?

A. Well, the correspondence which took place between Mr. Fabre and the Government prior to 1894, leading up to that, was to the effect that the paper was being printed largely for immigration purposes, and upon the facts being submitted to the Premier at that time, and I think Mr. Daly, the Minister of the Interior, they concluded, on the correspondence, that the \$1,000 should be spent out of the immigration appropriation for printing matter in that paper, and based upon the statements of the Hon. Mr. Fabre that it would be largely useful from an immigration standpoint. In that way it came to be charged to the immigration appropriation.

Q. I do not object to the publication of the paper because I believe it is good, even in a political sense, because it is always siding with the Government of the day. It publishes good articles on Canada, her banking and commercial institutions, and these articles are reproduced in the French, and in fact, the continental press. They are well written—Mr. Fabre is one of the best writers we have in Canada, and writes some beautiful articles on Canada, and thus makes our country known in Europe. I believe this money well spent, but though it may be a good channel to make the country known from an immigration standpoint, still I believe it does more in a general way, and should not be charged exclusively to immigration, in the same

way that Mr. Fabre himself is not an immigration agent, but is a sort of commissioner there—in fact he styles himself Canadian Commissioner in Paris—and is in constant communication with the Government and does on the Continent what Lord Stratheona does in England. He is a very useful man on the Continent. There are no Canadians who go to Paris, who have not to go to his office, and there are there large numbers of papers and documents on Canada, which are consulted by many people. Then from a financial standpoint, Mr. Fabre has been the channel for many institutions in Canada to get money on the Continent, through his instrumentality. He does a very good work. Mr. Foursan is, I believe, employed there as a sort of immigration agent; is he still on the staff?

A. Yes, he receives \$5 a day and expenses.

Q. What is his work?

A. His work is to look after the interests of immigration, visit people where necessary, and look after people leaving France. The only thing I will say regarding that \$1,000 appropriation, is, that if you can persuade the Government to charge it up to some other appropriation, it will leave us more money for other things.

*By Mr. Clancy :*

Q. I want to ask before proceeding with any other question if any of those agents who are on commission, issued certificates to persons leaving the United States for Canada; that is whether any persons in the United States who are paid on commission alone, issued certificates to persons leaving the United States for Canada.

A. That is the certificate upon which they obtain reduced railway rates?

Q. There is no other certificate is there?

A. No, that is of course the evidence of their work.

Q. Do any of these commission men issue these certificates?

A. Yes, I have the list here of all the commissions that have been paid and also who issued the certificates.

Q. The men who issued them?

A. Yes.

Q. Now, how many were issued by our agents?

A. That is by our salaried agents?

Q. Yes.

A. I have not that statement made out yet, they are working it out, but it is a very long statement in detail. You have to go over the records for 1899, and it takes time. I have those by the commissioned agents made out. That was the first question asked me.

Q. Can you give me how many were issued by the commissioned agents.

A. Yes, I will give it to you. In Michigan there were—

Q. If you will give the whole amount, just shorten it. I am not particular about each agency, but the number of certificates issued by each of these persons working on commission, as a whole, and those issued by our salaried agents?

A. I can give you the number of persons from the United States, upon whom commission has been paid for in the year 1899, giving each State and the number therefrom and the sex and age, with the name of the agent and the amount paid. That is as I took it down when it was asked for. If you do not want me to read it I can put that statement in.

Q. You might just put that statement in then, and not bother to read it.

A. The statement is as follows:—



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State.	Total Number.	Male.	Female.	Under 18.	Agent.	Amount.
Michigan.....	137	40	27	70	J. H. Galiver.....	\$ 244 00
".....	78	37	17	24	W. C. Sutherland.....	169 00
".....	1	1			J. A. Redmond.....	3 00
".....	1	1			M. F. Quaintance.....	3 00
".....	10	3	1	6	S. J. Gareau.....	17 00
".....	16	5	3	8	J. N. Simmons.....	29 00
".....	32	24	4	4	A. G. McKay.....	84 00
".....	2	1	1		Jamee Lyle.....	5 00
".....	11	3	1	7	Martin Conaton.....	18 00
".....	69	24	13	32	William Bolton.....	130 00
".....	8	3	2	3	E. W. Brown.....	16 00
".....	59	24	14	21	J. F. Turner.....	121 00
".....	8	5	2	1	J. W. Gordon.....	20 00
".....	3	2	1		A. Ford.....	8 00
".....	7	5	1	1	L. H. Howse.....	18 00
".....	32	16	8	8	G. Cockburn.....	72 00
".....	3	2	1		W. F. Baker.....	8 00
".....	1	1			John Wilson.....	3 00
".....	6	2	2	2	C. W. Tallant.....	12 00
".....	149	128	10	11	R. McKee.....	415 00
".....	5	1	1	3	B. Bingham.....	8 00
".....	1	1			Jesse Turner.....	3 00
".....	5	3	1	1	W. H. Aikins.....	12 00
Missouri.....	49	23	10	16	G. U. E. Griffith.....	105 00
".....	1	1			R. C. Owens.....	3 00
".....	41	16	9	16	M. W. Serat.....	82 00
Minnesota.....	1	1			Alley & Konzen.....	3 00
".....	18	5	3	10	E. L. Anderson.....	31 00
".....	2	2			C. S. Marsden.....	6 00
".....	173	61	28	84	John C. Koehn.....	323 00
".....	5	4		1	N. Campbell.....	13 00
".....	3	1	1	1	J. A. Sylvester.....	6 00
".....	3	3			S. F. Long.....	9 00
".....	103	76	13	14	J. H. M. Parker.....	268 00
".....	1	1			H. H. Howe.....	3 00
".....	6	3	1	2	John Marth.....	13 00
".....	1	1			G. M. Scott.....	3 00
".....	1	1			Nilson & Norlander.....	3 00
".....	5	1	1	3	P. W. Simpson.....	8 00
".....	4	3	1		J. A. McKay.....	11 00
".....	2	1	1		W. S. Clay.....	5 00
".....	2	2			J. McDiarmid.....	6 00
".....	8	1	1	6	T. Rattary.....	11 00
Wisconsin.....	5	1	1	3	Frank Heidt.....	8 00
".....	23	10	4	9	J. R. Means.....	47 00
".....	14	10	1	3	S. H. Shaw.....	35 00
".....	2			2	H. McRae.....	2 00
".....	9	1	2	6	A. R. Noble.....	13 00
".....	2	1	1		R. J. Dugdale.....	5 00
North Dakota.....	771	465	101	205	Wm. Ritchie.....	1,802 00
Texas.....	23	3	3	17	Capt. Barrett.....	32 00
New York.....	16	6	3	7	Rev. N. Dmytrow.....	31 00
Idaho.....	13	6	3	4	A. S. Rolo.....	28 00
Kansas.....	36	10	7	19	Isaac Welk.....	63 00
".....	13	5	1	7	J. A. Brogan.....	24 00
Iowa.....	177	88	29	60	N. Bartholomew.....	382 00
".....	11	3	4	4	A. J. Tuttle.....	21 00
".....	20	8	4	8	W. D. Brown.....	40 00
".....	2	2			J. T. McFee.....	6 00
".....	1	1			Rev. Geo. Thompson.....	3 00
United States.....	5	1	1	3	Rev. R. A. Burriss.....	8 00
".....	18	5	6	7	Joseph Poirier.....	34 00
".....	1	1			B. O. Monees.....	3 00
".....	19	10	6	3	Rev. F. Woodcutter.....	45 00
Ohio.....	1		1		H. C. Long.....	2 00
Nebraska.....	65	16	11	38	W. J. Pease.....	108 00
	2,320	1,192	368	760		\$5,072 00

I want to bring this to the attention of the Committee. I gave some time ago as the amount that we paid in commission, four thousand six or seven hundred dollars. The accountant informs me that there was more than this paid and that the correct amount is \$5,072, it is not a large difference but I want to call attention of the committee to that, so that if the statement is printed, I shall have the correct amount stated so that there will be no difference in the figures.

Q. That is not important. These persons acting there who are not the salaried agents of Canada, issue these certificates without the knowledge our salaried agents who are the responsible men there?

A. They do, that is to say; if the commission agent is asked for a certificate or is in communication with a person who is talking of coming to Canada, and the commission agent is satisfied that he is an agricultural settler, he will give him a certificate without reporting particularly on that one person to the salaried agent.

Q. Is it not possible that the commission agents may issue certificates and may send persons who merely want to take a trip for reasons that I will not mention now, if they are not under the supervision in every case of our salaried agents there.

A. I went into that question very fully at the earlier part of my examination, to show that the chances of a man taking a trip from any part of the States to Manitoba and the North-west and paying therefor, the lowest possible rate, from \$15 to \$40 for the the purpose of enabling the commission agent to make his three dollars are very slight.

Q. There is another and more serious chance that he may not be of the class of settlers we are endeavouring to get?

A. That, of course, as I also explained very fully at the commencement of my examination, we rely very largely upon the scrutiny of our agent to satisfy himself that the persons desiring a certificate was a bona fide intending settler, and that he came from the agricultural class.

Q. What he told you himself?

A. What he told the man who issued his certificate. Then again the Canadian Pacific Railway Company institute a very rigid examination at the boundary point, because to every settler that comes in there, they are willing to give a reduced rate, because his permanent settlement means more or less business to the Canadian Pacific Railway, and if he is not a settler, and they have to give him a reduced rate, it is simply money lost, so that every man that crosses the boundary is submitted to a careful scrutiny by the Canadian Pacific Railway, thus we can depend upon that examination combined with that of our own agent.

Q. I asked the question because with persons that are responsible of course, it is all right, but the remuneration is very small, to the commission agents, and persons that are not responsible, are not as likely to act probably with as much care as our own salaried agents, that is the reason I asked the question, speaking off hand.

A. I may say that the only State where there would be a danger of the Department being imposed upon in that way would be the State of North Dakota, where they cross the boundary line at very little expense, and get up to some point just for local purposes, say for personal reasons, but that is the State where the sub-agents' commissions are the lowest or practically nil. The work is done there by one agent practically, Mr. Ritchie, who lives at Grafton.

Q. There have been 11,945 settlers declared, brought in, and they represent in homesteads 1,064, do they not, according to the report, page 8 of Mr. Smart's report. He gives it 1,064, there, the total number of homesteaders, who made entries for 1899 is 6,689 persons representing 21,335 souls. That includes all the homesteads. Now, you have in one instance "declared settlers" 11,945, and you have homesteaders 1,064, at the average which Mr. Smart gives, namely  $3\frac{1}{3}$  persons to each family, that would give 3,549 souls. I am asking you to verify that if it is necessary.

A. It is just a question whether you take 1,060 or 1,154. There was some question between Dr. Sproule and myself as to which should be taken.

Q. I am taking Mr. Smart's report here.

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A. I think that there is a difference. He gives it 1,159 that came from the United States.

Q. Which of those are to be relied upon?

A. He gives the number of homesteads taken up by United States citizens as 1,169. I figure that out it would be 3,896 souls on that basis.

Q. Are you prepared to say that is correct?

A. No, that is made up by another branch, and therefore I give it for what it is worth. I figured it on that number, of about 4,000 people.

Q. From the United States, if we rely upon Mr. Smart's report, there were 11,945 settlers. That would give you the difference between that number and 3,549 to account for.

A. That is on the basis of 1,030?

Q. Yes.

A. Well, if it is on 1,030 I suppose it is correct, or upon the basis of 1,169 that would be about 4,000.

Q. In relation to the United States, how do you account for the existence of the difference being in that country?

A. Two thousand who came in by the Quebec and Lake St. John railway and the Montreal Repatriation Society from the United States.

Q. I am dealing now with those first that came into Manitoba and the West?

A. No, these came in from the United States to all part of Canada.

Q. The 11,000?

A. Yes.

Q. We have no evidence of that?

A. Yes, I have given the information every day since I came here. There were 906 came through the Lake St. John Company, 973 through the Montreal Repatriation Society, and 257 through Mr. Burriss, of Rainy River.

Q. We will take the larger figures—the 44,000.

A. No, the 11,945 is made up of people who came in from the United States, inclusive of the Quebec and Lake St. John Repatriation Society of Montreal and Mr. Burriss, of Rainy River or Port Arthur, that is 2,300 all told.

Q. That there may be no confusion I will take the larger number you have given, the 43,000 and take the number of homesteads?

A. We have done that, and got 15,000 or 20,000 I did not account for.

Q. Twenty-one thousand, I think. Have you, I just wish to ask shortly, any information in the Department which enables you to say that these persons located anywhere in the country and are still there. I mean the Department now?

A. Of the 30,000 or 32,000 that came in *via* ocean ports, somewhere about 6,000 or 8,000 remained in older Canada and did not report in the North-West at all. We can show that.

Q. The total number reporting at Winnipeg is 36,000, I think.

Mr. MACDONALD (Huron) objected to Mr. Clancy being permitted to take up the time of the Committee, saying that he had a series of questions which he wished to ask witness.

The CHAIRMAN—As far as my experience has gone, when any gentleman has been putting questions to a witness, he has been allowed to finish that examination.

After further discussion,

The CHAIRMAN ruled: My ruling is that Mr. Clancy has the floor, and is putting questions, and until he has concluded his examination, it is optional with him whether any one else shall be allowed to put a question. He is in the same position as if he had the floor in the House.

After further discussion.

The CHAIRMAN—I have informed myself of the rules which govern the House and the Committees and I have given my decision according to the rules. I believe I am right, and I care not what members think, I am going to rule as I believe right. On a previous occasion there was a great deal of fault found with the repetition of questions, and I was asked why I did not stop it. I informed myself on the matter and found I could not do it.



*By Mr. Clancy :*

Q. When we left off, Mr. Pedley, a moment ago, we were endeavouring to account for the excess of something like 20,000 upon the whole. Have you any definite information to enable you to say that these persons are still in the country?

A. We have no definite information that anybody at all is in the country except those we see, because that is really what it means; we have no passport system here.

Q. That is not the question at all, Mr. Pedley; the policy of the Government, as I understand it, is to bring in agricultural settlers?

A. Yes.

Q. Following that up, is it the policy of the Government to at least take some notice of where the agricultural settlers are located as an evidence that they are agricultural settlers?

A. I do not know that the Department has any definite system of following a man from the time he enters the country—

Q. Excuse me, that is not the question; I asked if it was the policy of the Department in following out the essence of this, since it is only agricultural settlers that they bring into Canada, whether it was the policy of the Department, having that in view, to see that these persons were settled somewhere in Canada as agricultural settlers?

A. So far as Manitoba and the North West Territories are concerned, it is, because the Government controls the crown lands there; they do not control the crown lands elsewhere except as Ordnance lands or Indian lands or, in British Columbia, lands within the railway belt, but where we do control the crown lands we are in a position to say with some degree of exactitude whether our lands are being taken up or not.

Q. Now are you able to say that of the homesteads taken up in Manitoba and the North West Territories—6,689 as given in Mr. Smart's report—that some portion of that was not taken up by the sons of persons already living there?

A. The report I think has the details, Mr. Clancy; all I know is what the report says.

Q. I asked if you have any knowledge yourself?

A. No, I have no knowledge of the homesteads except what comes in from other branches of the Department.

Q. Do you know whether there is any information in the Department distinguishing between the homesteads taken up by persons coming into the country or by persons already in there?

A. Generally speaking I think the application for a homestead will give the particulars as to the place of origin of the applicant, his age, whether he ever had a previous entry, and so on; it gives certain particulars, the application does, but as I never handle these I only know in a general way.

Q. Would you take this to mean 6,689 new homesteads?

A. I would take 6,689 to mean just what it says, that that many entries were applied for. Then you have there further details by whom they were applied for, so many Canadians, so many from the United States, so many Russians, so many Germans and so on; that is the only information we have.

Q. There is only one more question and I will conclude; have you any information in the Department that accounts for something like 21,000 persons, which is practically half of these that are said to be declared settlers; have you any information in the Department that they are declared settlers?

A. Information that they are declared settlers.

Q. Yes?

A. The information that we have of the 44,543, or whatever the exact number is, is the information that they are all declared settlers.

Q. Well you have accounted for something more than half that are called declared settlers—

A. Because they have declared their intention of settling here.

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Q. Is that it?

A. That is what is meant by declared settlers.

Q. When you make this statement that there are 45,443 declared settlers, that is based on the statements of the persons themselves that they are going to settle in Canada?

A. It is based on the statements of the people themselves that they are going to settle in Canada and on their arriving in Canada.

Q. And on that information you make up 44,543?

A. That is what is taken to from the total number.

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
FRIDAY, June 8, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock, a.m.; Mr. McMillan, Chairman, presiding.

Mr. Frank Pedley, Superintendent of Immigration, was present at the request of the Committee, and examined, as follows:—

MR. PEDLEY.—In answer to one question that has been put regarding the number of special agents in the State of Wisconsin, to whom commissions had been paid during the year 1899, I desire to report that the amount paid is \$110 to six agents in the State of Wisconsin. The number of people is 108.

*By the Chairman:*

Q. That is the state Mr. Currie is agent in?

A. Yes. The question I think was asked in the Committee two or three weeks ago. This statement is embodied in the statement that I laid on the table, but the question was asked particularly as to the State of Wisconsin, and this is the answer.

There was another question asked by Mr. Sproule some time ago, as to the collective cost of the literature as enumerated in my annual report. I gave, as the Committee will remember, the cost of each pamphlet, and he asked for the collective cost. A statement has been made showing that, as \$25,814.51.

At the commencement of my examination, or at least in the early part of the sessions of the Committee during which I was being examined, in dealing with the United States work, I omitted to mention that for the last three years we have had press excursions from the different States—from Michigan, Wisconsin, Minnesota, the Dakotas, Illinois and Indiana—of editors each year, representing a State association; last year the National Editor's Association took a trip through Manitoba and the North-West under the direction of our United States Inspector, Mr. White who accompanied the excursions in previous years also. They visited a large number of places in the province of Manitoba and the Territories, and if I am not mistaken, they went through to the coast, making a visit in the province of British Columbia. As a result of these press excursions, we have been favoured with a great many complimentary press notices free of charge, and have had an easy access to the columns of the papers for any write-ups in reference to the advantages and inducements of the country. In other words we have got a good deal of free advertising in connection with these press excursions.

Another phase of the Canadian work which I omitted to deal with at the time the matter was up before the Committee was as to how we employ some of our agents in the North-West in the winter time, and I may say to the committee that quite a number of the agents, as soon as the work ceased in the North-West, late in

the fall, were sent down to the United States; Mr. Speers, Mr. Sutter, Mr. Ens, Mr. Wendelbo, Mr. McEwen, Mr. Crerar, of Yorkton; Mr. Roy, the French interpreter at Winnipeg; Mr. Norquay, of Alamada; Mr. Rankin, who is stationed at Moose Jaw, and runs on the trains between Moose Jaw and North Portal, were sent down to the States during the last three years, to assist the regular salaried agents in connection with their work.

*By Mr. Clancy :*

Q. Are they sent there to co-operate with the agents already there?

A. They are sent there to co-operate with them; they do not always work together, in the same particular district at the same time, but they arrange between themselves as to how the work in the State shall be divided; the regular agent will take a certain portion of the State and the assistant for the time being will be put in some other portion.

Q. Are they under the direction of Mr. White?

A. They are under his supervision and direction locally. Of course the general directions as to their movements from Canada to the States and back again is done from the Department here, but as far as any local matters are concerned as to the details of their duties on the ground, it is largely left to be worked out by themselves and the agent in conjunction with Mr. White.

#### CHILD IMMIGRATION PROMOTED BY SOCIETIES.

With regard to the phase of our work we were discussing last day as to the settlement of the arrivals, there was one factor that I did not particularize, that is the immigrant children who come to Canada through the efforts of the Societies. The Committee will understand that there are a large number of societies scattered principally throughout Ontario and the province of Quebec, whose entire work is devoted to the selection and the bringing out of children from, say between five and sixteen years of age, and these of course are all included in the immigration arrivals and are given in our reports from the seaport agents, but 90 per cent of these are settled in the older provinces—they come to Ontario and Quebec and are settled by the persons in charge of the institutions there, being generally distributed as far as possible amongst the farmers of the neighbourhood.

Q. How many are there of these?

A. In the last year, 1899, the number of these as reported was 1,289. These are brought out by the institutions that I enumerated in the earlier part of my remarks. The annual report contains individual reports from nearly all these societies, so that the Committee can ascertain just what work is being done by these societies each year. Out of these 1,289 children there would be about 1,144 upon whom the government bonus of \$2 a head would be paid.

Q. To the steamship companies?

A. To the societies; this has been in vogue for a good many years. They are poor children and upon them we paid the bonus. We do not pay any bonus upon the workhouse children.

Q. They are included in that 44,543?

A. Yes.

Q. As declared settlers?

A. As declared settlers.

Q. That is not under the supervision of our active agents, I mean that part of the work to be done by our agents either in Europe or the United States, done by the societies?

A. Well, they are all from Europe practically.

Q. That would reduce the 44,000 by something more than 1,000?

A. No, they are paid out of our immigration appropriation.

Q. Yes, but it is a charge upon the public purse, is it not? But after all it is no part—you exercise no supervision over that do you?



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A. Yes, we inspect them.

Q. But I mean beyond inspection?

A. There is a great deal of correspondence between the Department and the Societies, as well.

Q. That would naturally arise from the inspection, but you do not exercise any control over their work?

A. Yes, we exercise control over their work. We have our officers at the point of starting and at the port of destination for the purposes of looking after immigration.

Q. For the purposes of this only?

A. No, that is part of their general work, exercising supervision over these children.

Q. I'll take the children now, embarking from, we will say, Liverpool. What inspection do they undergo there by our officers?

A. The agent at Liverpool inspects these children and, there is an affidavit made or a declaration is made, and given to him as to these children, as to whether they have been inspected by a medical officer as to their health, physically and mentally.

Q. That is furnished by the persons bringing them out, or by the societies?

A. That is furnished by the persons bringing them out, and it is handed to the officers of the Department at Liverpool.

Q. Will you please turn up and see whether he has made any report of that kind?

A. That of course is a part of his duties.

Q. Yes, but if he is performing these duties, we would expect some report of it?

A. I can bring you the report of every ship that leaves England and his letter from Liverpool.

Q. But that includes all others?

A. Yes, that includes all others. It is part of his regular duties though it is not in the Departmental Report.

Q. Does he report on each child?

A. He sends it along.

Q. He sends the number of children in each case?

A. Yes.

Q. I am afraid that they are in with the others, and from part of the whole number?

A. No, he does not certify to a lot of people that come here. These are specially under the supervision of the Department, because under the arrangement that has existed for some years, and probably which has arisen through public criticism as to the kind of children that it would be desirable to encourage to come to this country, a system was established which is practically in vogue to-day, of inspection and certificates, which is being done through the Departmental officers at the port of starting and the port of destination.

Q. Am I wrong in asking this? There has been some division in public sentiment as to the desirability of bringing these children at all to this country. I am not discussing the policy at all now, but there has been a great deal of zeal on the part of certain societies and persons to bring them here; that has not been greatly encouraged or discouraged has it by any Government in Canada?

A. Well, I do not know.

Q. If they were to drop off to-morrow would the Department make an effort. I mean to revive it, and get these children here?

A. As far as that is concerned from what I can gather from the records and from interviews in the Department in connection with this matter, the Department is of the opinion that child immigration to this country, has, as a matter of fact, been a success rather than a failure, and that it is immigration which might as well be encouraged as any other work of immigration. The matter has been gone into pretty fully as to the results, accruing for a period extending over some years as to the existence and development of criminal tendencies in these children.

Q. If my recollection serves me there has been very heavy criticism in the newspapers as to the crimes that have been committed by this class of persons throughout the country as they occur.

A. If you will turn up to the annual report of this Department for 1897, there is a summary of that work covering quite a number of years, where you will see that the tables upon which the conclusions are based in that report are in the Department, which will show, that the percentage of crimes among those who have come out under the auspices of these societies are very much smaller than the average during that period.

Q. The average of our Canadians ?

A. That is of all the crimes reported. Take the records as far as it is possible to separate the criminality of the boys and girls who have come out under the auspices of these societies, from the general criminality, the report shows that the percentage is smaller.

*By Mr. Broder :*

Q. Is that taking the same ages, these children come in very young, and down in the Ottawa valley there have been very serious crimes committed down there by children at a comparatively young age. Do they take into account the ages of both classes you speak of ?

A. I presume the comparison would be affected upon data where comparison would be allowed. My information is now that the average percentage or criminality as shown by the records, I fancy of the Justice Department ?

Q. That is the whole of the crimes ?

A. For the whole country.

*By Mr. Clancy :*

Q. Mr. Broder has asked of comparisons of similar ages ?

A. As far as that is concerned——

*By Mr. Broder :*

Q. Heinous crimes are very rare among our own children of young age.

A. They are very rare among the children brought out by these societies ; very rare. I fancy the average age of these children will be from ten to thirteen. I made a tour of inspection of most of the provinces of Ontario and Quebec, and the average age of the children I inspected would be about twelve to fourteen years. I saw very few under that age and only one or two were older. As far as I could see, they are not very much different from any one else. The point I wanted to make is this, in connection with these figures, that the impression might possibly have been created during this investigation, that we are claiming, that the 44,543 people who landed in this country as immigrants during the year 1899, all went to the North-West. The general opinion is that the west is getting all our immigrants, and I wanted to show to the Committee that there is quite a large percentage of it remains in older Canada, and part of it is handled through these societies.

*By Mr. Clancy :*

Q. Well, is that true as regards the classes that we are endeavouring to get here, namely the agricultural class. You are dealing now with children, the policy of the Department, the main aim is to bring agriculturists into Canada, I am sure I do not imagine we would have a single agent in England for the purposes of bringing out children, for the reason that the societies take them up and for the other reason that there is no pressing feeling in this country that they should come.

*By Mr. Rogers :*

Q. Is it not true that the supply is not nearly equal to the demand ? I know of many instances where the demand could not be filled.

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A. The information which has come to the Department through the officers of the societies is to the effect that they could place a great many more than are coming out at the present time. The number varies of course from year to year, sometimes there are more and sometimes there are fewer in number, but the restrictive acts of the provincial governments have no doubt had their effect. I do not know that we can hold the restrictive acts responsible for all the falling off, but there is no doubt that where the conditions under which these children come to the country, are made more stringent, it has a tendency to reduce the number who come out.

Q. What I was asking is this : The main object we are endeavouring to keep in sight is the number of agricultural settlers that came to Canada ?

A. Yes.

Q. The children of course are drawn from all classes ?

A. Yes.

Q. I understand it so, particularly from the lower classes ?

A. And placed with the farmers when they come here largely.

Q. So that when you say that there were so many declared settlers in Canada, you include all these little children ?

A. I include all who come in as immigrants.

*By Mr. Ingram :*

Q. Does that include the Barnardo crowd ?

A. Yes. About 1289 came in, in 1899, from all societies.

Q. Does not some Government agent assist in bringing them here ?

A. There is no Government agent, that is of the Dominion Government, of our Department who is specially charged with assisting in this work ; but these children come out originally through the efforts of these societies, but agents in the old country are charged with certain duties, especially the agent at the point of starting, at Liverpool, as to their having passed the medical examination and being duly certified as to their mental and physical health.

Q. That is Mr. Jury ?

A. No.

*By Mr. Broder :*

Q. That applies to those brought out through the instrumentality of these homes I suppose ?

A. Yes.

Q. That applies to them as well as to those that come through the agency of the Government ?

A. The agency of the Government is not an agent of the Home.

Q. Suppose an application comes to your agent for children to be sent out, I suppose they would be sent out ?

A. If an application for children came to the Department we would communicate it to one of the homes.

Q. This as to medical inspection applies to these homes ?

A. Yes, the certificate must be made by a duly registered agent of the society. This includes the case of those that may be brought out by the societies here ?

A. The societies here are generally branches of the societies in the Old Country, or they have their branches in the Old Country : so that the work of commencing the movement in the Old Country and finishing it here, is all done under the one society, either through its head quarters or branches.

Q. The point is that this departmental regulation as to health inspection and all that applies, to these people whom they send out ?

A. It applies to all children coming out through the instrumentality of these homes.

Q. That is right, that should be so ?



A. Mr. Ingram intimates that he thinks that the work of certifying to the health of the children, leaving Liverpool, would be done by Mr. Jury.

*By Mr. Ingram :*

Q. The reason I stated that is that Mr. Jury is stationed there?

A. Mr. Jury is the Canadian Government agent for the north of England, and his duties are more particularly to devote himself to outside work, lecturing and matters of that kind, with the view of inducing people to come to Canada. The office work is under the charge of Mr. Mitchell, who, I think, has been at Liverpool now for some years, and who generally certifies as to the children fulfilling the conditions prescribed by the regulations.

#### CLASSIFICATION OF IMMIGRANTS AS TO AGES AND EMPLOYMENTS.

*By Mr. Clancy :*

Q. All the persons over twelve are counted as adults coming into Canada, are they not?

A. Yes, they will be counted as adults according to the ordinary steamship classification.

Q. You have no other classification?

A. We have another classification as to the payment of continental bonuses and as to people coming from the United States. Eighteen years is the adult age there.

Q. Yes, but with regard to Europe, you have twelve years as the age?

A. Well, twelve is the adult age as fixed by the steamship companies.

Q. And what other classification including the United Kingdom and the Continent, what other classification have you than those appearing in the reports from our own agents?

A. We have this classification : Take the steamship limit of twelve years and those over twelve years of age are considered as adults. That would apply to the adult and infant arrivals as far as general classification is concerned, but for the purpose of paying the continental bonus, we must ascertain all those over eighteen years of age, because we pay no bonus on those under eighteen. For the purpose of paying the bonus on those entitled to it, coming from the United Kingdom, the twelve year limit applies because the bonus of \$1.75 is paid on all over twelve years of age, and 87½ cents on those under that age.

Q. I notice in the steamship arrivals that the total number of arrivals is 43,895. I am taking the classification given there. This includes St. John, Halifax, Quebec, Montreal, all the arrivals. Some of those at Montreal are not steamship arrivals, I mean landing at Canadian ports. The total number as it appears there seems to be 43,895. The farmers and farm labourers in that number, 6,889, including all persons twelve years and over?

A. From whose report is that ascertained?

Q. That is in the steamship reports at St. John, Halifax, Quebec and Montreal?

A. Yes.

Q. Now, that is taking the boys of twelve and above, and all the farm labourers. If that report be correct is it not a small number?

Q. That is the total, 43,895. There is some misunderstanding, for that calculation takes no notice of the 6,500 Doukhobors that came out here, who are all farmers. There is not one of them who is not on a farm unless he is doing a little temporary work on the railway, and it takes no notice of the 6,600 Galicians who are all farmers.

Q. I am not speaking of the agricultural class, but the classification of those discriminated as farm labourers and farmers.

A. Well I don't just exactly understand what the point is.

Q. Well the point is this, not exactly how many of the agricultural class have come out, including the children, but those persons coming from Europe designated as farmers and farm labourers; of the 43,895 there only appears to be 6,889 of this

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class, and it would also appear that you include all male persons above 12 years of age?

A. Is that a computation made by yourself, Mr. Clancy, or taken from the records.

Q. Yes. You might turn up St. John there, which comes first in the list?

A. Yes.

Q. Now there are farm labourers and farmers under the different columns, are there not?

A. Yes. 'Steerage passengers for Canada at St. John,' there are of agriculturists—

Q. No, I mean farmers and farm labourers, that will be under the column of occupation.

A. Well under the table from St. John of steerage passengers for Canada there is no such classification as farmers.

Q. Oh, yes, there is.

A. What page have you reference to?

Q. I have not the page here, but I am very sure at St. John, farmers and farm labourers are shown in parallel columns somewhere.

A. Well at page 45 of the report I have the statement showing the steerage passengers for Canada, at St. John. Under the general classification of occupations I find enumerated: first, agriculturists; second, general labourers; third, mechanics; fourth, clerks and traders; fifth, female servants; sixth, not classified; seventh, total.

Q. How many agriculturists?

A. Under 'agriculturists' you have 1,350, under 'general laborers' you have 101, under 'mechanics' you have 73—

Q. Wait a minute, that is general labourers, is it?

A. General labourers, yes,

Q. That is 1,451, I have given these under there in mine all as agricultural labourers and farmers. I have taken that whole class in St. John.

*By Mr. Ingram :*

Q. These are arrivals for March and April only?

A. Which?

Q. The mechanics that you are speaking of?

A. Mechanics?

Q. Yes, for the months of March and April.

A. No, you will find in January there were 12, in February 20, in March 4, in April 20, in May 7, in July 5, in September 1, in October 4, or a total of 73 for the year.

*By Mr. Clancy :*

Q. I have taken all the agricultural class, 1,451 as you read there, and taken them all as that class. Then in the cabin you will find a few of these persons there, at St. John?

A. Yes.

Q. It seems to be 39 or something like that?

A. Yes.

Q. Now that would mean at St. John there landed 1,490 persons in that class, that is farmers and farm labourers, that is assuming all these are?

A. Well, there is one column here which you left out entirely.

Q. What is that?

A. 'Not classified.'

Q. Well, I suppose that is 'not classified,' that since there are others classified as agriculturists that there are none among that number?

A. The presumption is that they are all agriculturists.

Q. How do you arrive at that?

A. Because if they fell within any other class we would specify them.

Q. Do you say the aim is to bring out agriculturists and agricultural labourers, that we have classed these here and those not classed are to be lumped in with them?

A. The classification here is made up from the ship's manifest.

Q. Who furnishes that, who furnishes the information for this?

A. In the first place it is furnished by the Purser.

Q. Well, who furnishes the Purser with it?

A. The Purser is supposed to take his information from examination of the passengers on the collection of their tickets.

Q. Well, do the booking agents not make any report, because you trust to them largely as to the class of persons coming and on whom the bonus is paid? Now, is any bonus being paid except for these farmers or farm labourers?

A. No, we pay no bonus except on these.

Q. Then I suppose there is some pains taken to ascertain that we do not pay a bonus on any others?

A. That is ascertained on presentation of the certificate at the office of the commissioner of immigration at Winnipeg.

Q. And not till then?

A. It is not adjusted till they reach there.

Q. No, I mean when you ascertain that the proper class is coming?

A. That is at the other end.

Q. Well, I suppose there is some definite idea as to the class coming in?

A. Well, in the last analysis the report of the commissioner at Winnipeg determines that.

Q. No, I am following now the persons that came in by the steamships, and the information must have come through our agents on the other side of the Atlantic, whether booking agents or others, for this classification.

A. The classification is furnished our agents at each port by the steamboat companies. They ascertain from them the number of steerage passengers on board, the origin of each, their place of destination—

Q. And occupation?

A. — and their occupation. The agent at the port of landing compares the list furnished to him by the steamboat company, with the souls on board. He goes over them one by one and checks them off.

Q. With these designations?

A. Well, he is more particular as to the numbers.

Q. He undertakes to make a classification from some information?

A. That classification is from the information furnished by the steamboat company, but the number of people certified to, is by actual count.

Q. Where?

A. At the port of landing.

Q. Well, this is at the port of landing; this is the actual number of agriculturists and agricultural labourers at the port of landing.

A. I don't say the agent at the port of landing discriminates as to occupation.

Q. Well how does he put this down?

A. He puts this down from information furnished by the steamboat company.

Q. Well, are you sure; have you any record in the Department as to that being the course followed?

A. Well, I don't know that we have any particular record except that the agent at port of landing certifies that he has counted the number and compared it with the number given by the steamship companies.

Q. You will see the crucial point is this, we are endeavoring to bring in a certain class and there is nothing that should be more prominently kept in sight than the number and the class of those coming in. Then if you are not there at an actual count or have not the record—I ask without being offensive—how you can be positive about that?



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*By Mr. Stenson :*

Q. I do not see how they could have positive information with regard to the number of farmers and farm labourers.

*By Mr. Clancy :*

Q. The positive information is given.

*By Mr. Stenson :*

Q. I beg pardon. What Mr. Pedley says is that positive information is given with regard to the numbers, but with regard to classes there cannot be positive information.

*By Mr. Clancy :*

Q. Why ?

*By Mr. Stenson :*

Q. Because they take it from the steamship companies.

*By Mr. Clancy :*

Q. But what are our agents doing that are sending them here from the other side?

A. Out of the classification here given, that is that they are not specially distinguished and are under the heading 'not classified', you have 3,007 people.

Q. Now is it possible that there is not one of these a farm labourer or a farmer?

A. Is it possible?

Q. From the information you have is it possible that there is not a single one of these a farmer?

A. If you tie me down to saying that it is possible there is not a single one a farmer, I would say that it is quite possible that that number of people would come to the country that are not farmers. But as far as this particular lot is concerned,—

Q. I am not giving any opinion but I am asking is it possible in the light of the information you have, is it possible that not a single one of these was a farmer.

A. I think it is not possible.

Q. I have not asked you that, I have asked you in the light of the definite information you have, is it possible none of these are farmers?

A. No.

Q. What information have you that any of these are farmers, of the 7,000 not classified?

A. Of the 7,000?

Q. Not classed?

A. What 7,000?

Q. You mentioned 7,000 not classed?

A. I said 3,007 were not classified.

Q. Well, I will say 3,007?

A. Those that came in *via* St. John.

Q. Of these have you any information that a single one of them was a farmer?

A. The information that I have of those that came in *via* St. John as steerage passengers is that the majority of these went right through to the North West and the records are on file.

Q. That is not what I want to get at. If they were blacksmiths or watch-makers you would not have brought them. What I want to get at is, if I can, have you any information that a single one of these that are not classified are within the classification of those that we are endeavouring to bring out.

A. Yes, we have the notification of the booking agents that those upon whom they claim commission are agriculturists.

Q. Of unclassified persons?

A. That are under this heading as unclassified. These people have gone through to the North West and the ship's manifest which has been given to the agent at the port of landing and verified by him as to the number, is further verified by the Commissioner of Immigration as to their occupation. Probably the great majority of those unclassified are women and children.

Q. Have the booking agents reported so many agriculturists coming to Canada and a number of unclassified persons coming to Canada, do they claim a bonus on them?

A. I do not understand.

Q. There are certain persons classified here, in the case of St. John I take all the persons amounting to 1,490 persons, upon these it would be reasonable that the bonus would be paid, because they are so designated, and they are the class of persons we are endeavouring to bring out, and the only class. Now do the booking agents report another lot of persons whom they cannot classify, and if they are not classified the reasons are obvious that they cannot be classed as agriculturists; do the agents claim a bonus upon them also or any portion of them?

A. The steamship agents claim a bonus upon all agricultural immigrants over eighteen years of age landing at Winnipeg.

Q. Do they report them as such?

A. They make a claim to the High Commissioner or to the Department for the bonus, and the lists are furnished giving the names of the persons upon whom the bonus is claimed.

Q. And they are agriculturists?

A. And if they are agriculturists and are certified to by the Commissioner of Immigration at Winnipeg, why then the bonus is paid.

Q. But the agent designates everyone as an agriculturist for the simple reason that that is the class he gets his bonus on, in other words, he would have no object in designating any one as anything else but an agriculturist, because, under the spirit of the law he would not get a bonus on them?

A. He would not get a bonus except on persons reaching Winnipeg and coming from a certain country.

Q. If he had any object it would be to make the number of agriculturists as large as he could

A. In the first place, the booking agents would have nothing to say about these coming in, because a great many of them came in as Doukhobors upon which no bonus was paid. Allow me to make this clear to the Committee. The Doukhobors chartered a steamship themselves and sailed from Batoum which is in Asia, they were entirely outside the European regulations, so that the European booking agents could have no claim upon the bonus even supposing they had come out in the ordinary way.

Q. No, but we paid the bonus anyway?

A. Yes. We paid it to the Doukhobors themselves. The steamboat was chartered by the Doukhobors or their representatives and they came direct from Batoum to Canada, and were immediately transferred from the boat at the port of landing to the trains and sent to the North West.

Q. That does not affect what I am endeavouring to get at, which is whether the system that is earnestly sought by every man in this country who takes an interest in the matter, and that is that if we have an immigration system at all it is for a single class which is admitted to be beneficial to the country, all others are not discouraged, they may come if they like, but the idea is that we pay our money only for a certain class. Let us trace up and see if the records are reliable, if they are not we had better know it, but if they are reliable, that there are many persons belonging to that class, coming out, we have to take them as they are unless there some reason to show that they are faulty, and not to be relied on, if they are it is a serious matter. I take the records as they are here and am bound to accept them unless Mr. Pedley can show they are not correct.

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*By Mr. Stenson :*

Q. Haven't you the records of the number of immigrants that came into Canada ?

A. Yes.

Q. Will not that show how many agricultural labourers came in ; I understand this is the record from the steamboat landings, but isn't there the record of settlement and where they went in to work and settled. That is where we will get the number.

*By Mr. Ingram :*

Q. Mr. Pedley, those arriving at St. John, New Brunswick, I find there are 3,007 not classified, that is steerage, but of cabin passengers there were 222. Surely there are some means by which the occupation of these 222 cabin passengers could be found out ?

A. We do not classify the cabin passengers as immigrants. They may be immigrants. They may be immigrants, and may come out here to settle, but for the purposes of immigration we confine ourselves to the steerage passengers.

*By Mr. Clancy :*

Q. When they classify them in many cases they classify them according to their own information. Then at Halifax there are 189, I think, unclassified ; there are at St. John 222 passengers not classified ?

A. What page is that ?

Q. That is on page 46, you will see pages 45, 46, 47 and 48 are tables giving the number of each class that arrived. I also notice there are four cabin passengers as immigrants for the United States, and 532 steerage passengers for the United States which are not classified also. But of the 3,007 not classified as steerage passengers, and the 522 cabin, they surely should be classified in some way giving their occupation.

A. The cabin passenger is only taken account of at the port of landing and is not looked upon as one of our immigrants. We take the steerage passengers only. The cabin passenger as the Committee will readily understand is a man who may be a returned man or a tourist or a business man. Most men who visit the Old Country travel by cabin. Tourists and well to do class travel cabin, but generally those who come from the Old Country as steerage passengers, according to the experience of the Department come as settlers.

Q. These figures are total of all classes who arrive at St. John ?

A. Yes, the total movement of population at St. John.

Q. That includes everyone.

A. Yes, and this information is very largely a duplicate of the steamboat manifests.

Q. How do you make out about the immigrants ? Suppose I should go to the Old Country and come back as a steerage passenger you would not classify me as an immigrant ?

A. No unless you slipped in. If you passed the scrutiny of our officer he would classify you. If he found out from you that you went over on a trip to the Old Country and were coming back, in other words that you never changed your domicile, we would scratch you off the list or ear mark the list showing that you are a returned man.

Q. I would not be classed as an immigrant ?

A. No.

Q. These have all been questioned as to whether they are immigrants or not ?

A. The agent at the port of landing is instructed and so far as I know, does take steps to know that those who come in as declared settlers are really such.

Q. Do you know of any case where a person going from Canada or even from the United States comes back as an immigrant although he is not, but takes advantage of it in that way.



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A. I know of no case; it would be very exceptional; a man who is going to the Old Country would hardly do it, simply for the purpose of coming back as an immigrant.

Q. I think some years ago when they were assisting immigrants there were cases of that kind.

A. There is no doubt about that. But when the passage is paid they would come in anyway. That was one of the objections to the assisted passages. Another was, that when you got a person over to Canada he simply had to cross the border into the States.

*By Mr. Clancy :*

Q. I see there are here those who are classified as returned Canadians, and tourists both.

A. Yes, they are distinguished.

Q. There are not many of those at St. John ?

A. No, they generally land at Halifax. Then if there are any cases of disease on board the quarantine facilities are there. The steerage passengers are all debarked at Quebec in the same way. None of them go to Montreal.

*By Mr. Ingram :*

Q. You said there were fewer parties of children inspected, '38 as compared with 45 last year, but the number of children was slightly greater, 1,298 against 1,239 ?

A. It says the number of parties was less, but the number of children was greater, so I presume the parties were larger.

#### JUVENILE IMMIGRATION IN 1899.

Q. The number of parties of children were fewer ?

A. What he means is that the children came out in parties. For instance one of the officers of the society comes with a party of 50 and another with 60.

Q. So this would mean there were 38 parties this year against 45 last year.

A. And the 38 parties this year represented 1,298 and the 45 last year 1,239. Thirty-eight parties represented 1,298 and 45 represented 1,239.

Q. It is not very clear ?

The WITNESS—If there is nothing further on the line of that branch of the enquiry about which the Committee wish to ask any questions there were one or two other matters that were introduced. I think if I remember correctly, when Mr. Taylor was here the other day he asked me if I did not think the expenses of one of our agents, I think he mentioned Mr. Currie, who is getting a salary of \$1,200 a year and whose expenses with his salary amounted to about \$2,700, was not very excessive. I have the list of officers employed in the United States for several years back.

*By Mr. Ingram :*

Q. Who is this Mr. Currie.

A. Mr. T. O. Currie is our agent at Stevens's Point, Wisconsin.

Q. That is the Patron gentleman ?

A. He is our agent now, I do not know what he is politically.

*By Mr. Clancy :*

Q. Did you know anything about him before he was appointed ?

A. I knew him before.

Q. You met him pretty often, didn't you ?

A. Sometimes.

## APPENDIX No. 1

Q. Since this came up, although I did not bring it up myself, what position in politics did he occupy?

A. So far as I know of him he was a public speaker. I don't know what position he occupied in politics. I have seen him once or twice as a public speaker. I have heard him speak in different parts of the country sometimes in favour of one candidate and sometimes in favour of another.

*By Mr. Ingram :*

Q. A sort of free lance?

A. Yes, I think he claims to be an independant man.

*By Mr. Clancy :*

Q. He is not quite so independent now?

A. Well, I do not think anything has transpired to shake his independence.

## COMPARISON OF AGENTS AND EXPENDITURE IN THE UNITED STATES FOR A SERIES OF YEARS.

Now in the year 1892-3 we had 48 salaried agents in the United States.

Q. How many?

A. Forty-eight.

*By Mr. Stenson :*

Q. What year is that?

A. 1892-3. We had 48 agents with salaries aggregating \$20,064.91, and with allowances for board and lodging of \$16,554, and for general expenses \$14,555, or a total expenditure that year for salaries, allowances, and personal expenses of \$52,012.83.

*By Mr. Clancy :*

Q. Well, Mr. Pedley, will you tell me what that has to do with what we are asking now?

A. Well, it arises out of a question Mr. Taylor asked; the other day he asked for the general expenses and said that the expenses in the United States were high and he instanced Mr. Currie's; and I stated then to the Committee in answer to Mr. Cochrane that the question of expenses had been a matter of moment to the Department for years, and I gave the Committee a statement for the expenses of one year that I happened to have at hand. I have here now a statement of the salaries and expenses of the United States work from 1892-3 down to 1897-8.

Q. Now, my object at the start was not to make a comparison with any year whatever; I was endeavouring to get at the work of the present year. Now if you are to show what may or may not be a discreditable record in the year you have mentioned, does it in any sense affect the work of the past year?

A. No.

Q. To show there was that amount of money spent and so little result for it, can really have no effect any way in proving the work was well or ill done last year?

A. No, what I am trying to show is this —

Q. Well, if you are prepared to prove several years are wisely done and then that it was as well done this year, I think you have made a good case. I don't think, Mr. Chairman, that should be brought in here and made a matter of record. It is a matter for the House. That question has not been raised.

A. Well, the question was raised by one of the members of the Committee.

MR. CLANCY—Not by way of comparison. You may send for Mr. Currie's accounts; I did not bring this up before, but Mr. Currie travels in that country—I have been in that country and know something of it—and in the small places he is

in, he charges up \$2 a day for hotel. Now, things must have changed since I was there if that is the rate. I did not bring that up, and do not think it proper to discuss it. When Mr. Taylor brought it up it was not by way of comparison with former years. I am not here to defend or condemn what was done in the former years, but we cannot enter into a comparison of which is better. What I am trying to get at is the work of the year, and not saying one system is better than another.

The CHAIRMAN.—I think Mr. Pedley, from what has taken place, is quite right to make the statement he has. It is only a small statement.

Mr. CLANCY.—Well, I will take an opportunity of going back and comparing many years, because there are many favorable years to the Conservatives and I would ask for time, this Parliament at any rate, to go into that.

The CHAIRMAN.—There have been many questions this year as to the number of agents and their cost and this is answering that.

*By Mr. Ingram :*

Q. The figures you gave were for 1892-3 ?

A. Yes.

Q. Forty-eight agents, costing \$52,000 odd ?

A. Forty-eight agents, costing \$52,012.83.

*By Mr. Clancy :*

Q. Have you the number of days each agent worked ?

A. Yes.

*By Mr. Ingram :*

Q. If you just simply give the figures it will save time.

A. Many of these agents were not working there the whole year. I have the number here, one man worked 154 days, another man four months, here is one twelve months, another worked three months and twenty-six days.

Q. Suppose a man comes along and wants to work as an immigration agent in the United States and is sent over for three months to Kansas, or Missouri, or Dakota, or some other State; is that frequently done ?

A. It is done occasionally.

Q. I would like to ask, too, is it not a fact that there are several hundred applications from parties who wish to act as immigration agents in the States ?

A. Several hundred applications ?

Q. Several hundred applications.

A. I could not undertake to say that.

Q. Could you undertake to answer that at the next meeting ?

A. I will undertake to answer now, that is as far as the records of the Department go, there is no such number of applications. Of course you will understand there will be an application now and then for a man to be placed on the immigration staff. The applications would not come to me officially; I cannot say as to the applications that would come to the parties who had charge of the patronage.

In the year 1893-4, there were forty-four agents whose salaries aggregated \$15,504.30, whose allowances for board and lodging amounted to \$12,449.30, and whose general expenses were \$16,556.88, or a total of \$44,510.61. In 1894-5 the number of agents was dropped considerably and there were only eleven.

*By Mr. Clancy :*

Q. Are you giving the number of immigrants brought in each year ?

A. I had a list made out of the number claimed to be sent in by each agent and the number of homesteads taken up. I had the list partially made out last night and am completing it.

Q. I will ask you to go back ten years and to give a similar table.



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A. The reason I take 1892-3 is that it was the first year it came into our Department. Previous to that it was under the Department of Agriculture, and I am only taking the years in which it was under our Department proper.

*By Mr. Gilmour :*

Q. Are you taking the whole of the agents in the service in the United States and Europe?

A. The salaried agents in the United States.

Q. And Europe?

A. No, just the United States. The discussion arose out of the feature of it as to whether the expenses in the United States were not rather high, and I show that for a good many years that has been a very moot question.

In 1894-5 the number was eight and eleven, and the salaries \$4,269.66, the expenses \$4,189.59, and the total \$8,459.25.

In 1895-6 there were eight agents, and the salaries amounted to \$2,940, the expenses to \$4,373 and the total \$7,313.

In 1896-7 there were 14 agents, and the salaries amounted to \$4,988.45, and the expenses to \$5,856.17, making a total \$10,844.62.

Now the expenditure for 1898 will be—I have it here, but it has not been added. The expenditure for 1899 has been before the committee during this examination.

*By Mr. Clancy :*

Q. Well, would it not be well to add it to that table and put the whole thing in together?

A. Yes, the whole thing will be put in this table. Then I had the number of people sent from the United States.

*By Mr. Ingram :*

## NUMBER OF AGENTS EMPLOYED IN THE UNITED STATES.

Q. Before you come to that have you the number of agents in 1897-8.

A. I have not that number down with regard to that particular year, but it will be about the same number.

Q. It was about 14 last year?

A. Yes. The number of agents for 1899, salaried agents is 11, but in 1898 there may be one or two more. We had some special work in connection with the Omaha exhibition which necessitated one or two more agents.

*By Mr. Gilmour :*

Q. Before that table will be of value, you will require to have it in detail?

A. Yess I have it in detail here.

*By Mr. Clancy :*

Q. You havn't 1898 in here?

A. No, they are working at it now, but the statement will be attached to that table.

Q. You have not 1899 either?

A. I did not instruct them to have it because I gave it to the committee during this examination.

Q. I do not know but it will be as well to have it in here also. You are going to file this right now?

A. Yes. But the other will be attached to it so as to make it complete?

*By Mr. Ingram :*

Q. I see twenty agents here report from portions of the United States. Under the heading 'operations in the United States' there are some twenty agents who report in the year 1899?

A. There must have been some commission men reported—let me see who they are and I can tell you? That is a commission agent.

Q. In North Dakota?

A. Yes. Here is a man whose headquarters is at Montreal, but he works in the Eastern States. The Quebec and St. John Railway, with headquarters at Roberval, Mr. Dupont. Then Dr. Brisson has his headquarters in Montreal; and Prof. Mavor, who was not in the United States at all, the classification is wrong there. There are about ten or eleven salaried men paid by the Department.

*By Mr. Clancy :*

Q. Who had charge of this branch when it was in the Agricultural Department; I do not mean the officer, but what particular branch; we must have this information from the Department of Agriculture? It was in the Department of Agriculture in 1892, and was then transferred to the Department of the Interior.

A. In the forefront of 1892.

Q. Will you undertake to have the information, as you are in charge, prepared by the proper officers to give it; the information for some years prior to this you have given now, namely 8 years?

A. I do not know that I can undertake that because I have not control of the officers in the Department of Agriculture but, I do anticipate there will be any difficulty in getting the statement made.

Q. It is but right that we should be in a position to compare it. And since you have put this in, it would be only fair that you should now undertake to do so. I have no doubt you would not have any difficulty in getting out the same statement from the Department of Agriculture for the eight years prior to the statement you have made here?

A. I have no hesitation in saying that I will endeavour to prepare that statement, if the Committee will ask for it, of course, I can ask for it.

Q. I would suggest in this connection that for the purpose of being able to see it at a glance, the number of persons claimed in each year as coming in, that be put in as a part of the statement and not made a separate part. It is only fair to put this in now as the other has been put in. I am not going to complain of the ruling of the Chair as to this going in, and I am sure the Chairman will assent to what I am saying as a proper thing; and I will ask Mr. Pedley that the number coming in in each year should appear opposite the other figures in each case. That will make a very complete statement. I can say at the outset, that it is no part of my purpose to defend or to try to defend what was done in the past, but since this statement has been put in; every person will agree with me that we should have a complete statement.

A. The work of immigration of course becomes instructive to those who study it, and you find, by tracing back in previous years, the attempts which were made to induce people to come here.

Q. I am sure that at no time has it been more successful than we would like?

A. There is no particularly well laid scheme that could be adopted. You have to move according to the tendency of the people, as conditions and circumstances may arise, and though to-day we may do a certain thing successfully and to-morrow we cannot do it, there is generally some reason for it.

Q. I see you do not give the homesteaders here?

A. No, they are being made out on a separate sheet, and I thought they would be here before the Committee rose.

Q. If you were to turn the sheet the other way it would be better, and we will have all of them on the one sheet, and it will be a good record for the country to

## APPENDIX No. 1

see, I have not the slightest objection to it, but we should have it complete in that way?

A. I will make the statement as complete as possible.

The subjoined is a list of local commission agents in the United States on April 3, 1900:—

## MICHIGAN.

D. Allard, Milwaukee.  
C. H. Arnott, Levering.  
Wm. Atkins, Vassar.  
Geo. H. Beach, North Branch.  
F. M. Beaman, Albion.  
Thos. Brennan, Chesaning.  
F. Bellinger, Bessemer.  
W. Benn, Saginaw.  
W. Bingham, Gayetown.  
Wm. Bolton, Midland, Midland Co.  
Ed. Bosley, Unionville.  
D. Brown, Sebawaing.  
E. W. Brown, Farwell.  
Jas. W. Bauer, Hastings, Barry Co.  
E. G. Brainard, Stanton, Montcalm Co.  
N. P. Chamberlain, Mancelona.  
C. H. Clark, Stanwood.  
W. H. Cline, Mount Pleasant, Isabella Co.  
Geo. Cockburn, Ludington, Mason Co.  
Martin Conaton, Bad Axe.  
H. C. Cudney, Ewart, Osceola Co.  
E. A. Convis, Owosso.  
J. J. Dodge, Decatur, Van Buren Co.  
Jno. Doyle, Saginaw.  
M. F. Denyes, Caro.  
H. H. Davis, Caseville.  
J. K. Durst, Gaylord, Otsego Co.  
J. P. Faurott, Pontiac.  
G. Freeman, West Harrisville.  
A. Ford, Charlotte, Eaton Co.  
Dr. S. J. Gareau, Saginaw, Saginaw Co.  
Henry T. Gilbert, Sand Beach.  
John W. Gordon, Cass City.  
Geo. Greenwood, Elmira, Otsego Co.  
Bruce Green, Mantou.  
Erastus Harris, Lakeport.  
F. C. Harrison, Howard City, Montcalm Co.  
V. S. Hollinbeck, Alma.  
L. H. House, Brown City.  
A. F. Houston, Crowwell, Sanilac Co.  
G. F. Field, M.D., Chase.  
H. D. Kellar, Wyandotte.  
Walter S. Keyes, Coleman.  
R. A. Kilgour, Marlette.

A. Leiberthal, Ironwood.  
James Lyle, Fife Lake, Grand Travers Co.  
Angus G. Mackay, Port Huron.  
D. J. McGinnis, Cooks, Schoolcraft Co.  
James McLean, Reed City, Osceola Co.  
R. H. Martin, Standish.  
W. A. McLean, Greenville.  
Geo. E. Newell, Flint.  
Ernest Nicholson, Luther, Lake Co.  
N. J. Oliver, Black River.  
V. A. Poole, Cedar Springs.  
H. C. Pierce, Elk Rapids.  
M. F. Quaintance, Petoskey.  
J. A. Redmond, Sanilac Centre.  
Grant Reid, Vernon.  
Dell Roberts, LeRoy, Osceola Co.  
V. S. Rolfe, Tustin, Osceola Co.  
Rev. Albert E. Seibert, Lake View.  
A. J. Sheldon, Port Austin.  
F. Schmack, Sabawaing.  
J. N. Simmons, Deckerville.  
H. A. Spencer, Cadillac, Wexford Co.  
B. S. Stratton, Owosso.  
Wm. C. Sutherland, Sault Ste. Marie.  
Smith & Crane, Eaton Rapids, Eaton Co.  
A. L. Thomas, Grand Haven.  
Jno. F. Turner, Clifford.  
A. J. Urquhart, East Tawas.  
L. E. Vorce, Frankfort.  
John Warehock, Parisville.  
J. H. Westerman, Paris, Nocosta Co.  
O. W. Wiley, Big Rapids.  
John Wilson, Carsonville.  
Rev. A. Wood, Munith, Jackson Co.  
W. Wallace, Ionia, Ionia Co.  
Woodworth & Turtle, Traverse City.  
J. P. Galliver, Clare, Clare Co.  
W. A. Thomas, Bay City.  
O. H. Todd, Centreville, St. Joseph Co.  
W. S. Wilson, Barrytown, Mascosta Co.  
C. W. Tallant, Shelby.  
W. D. Springer, Whitehall.  
Rev. B. Merry, Joyfield.  
A. J. Gibson, Kalkaska, Kalkaska Co.

## MINNESOTA.

Alley & Konzen, Hallock.  
E. L. Anderson, Milaca.  
C. K. Blandin, Olivia.  
John Boyes, Edgerton.  
N. Campbell, Crookston.  
J. E. Craig, Pipestone, Pipestone Co.  
B. Crane, Jackson, Jackson Co.  
Guy Ewing, Princeton.  
F. W. Goertz, Theilman.  
A. H. Hill, Winona.  
E. Goodenough, Adrian, Noble Co.  
H. H. Howe, Wheaton.  
J. C. Koehn, Mountain Lake.  
F. X. Folher, Glencoe.  
Koch & Sylvester, Herman.  
T. H. Larke, Duluth.  
Jas. McDiarmid, Fulda.  
H. F. McGonegle, Waseca.  
Chas. H. Marden, Bainesville.  
Wm. Maynes, Luverne.

Peter Johnson, Fosston.  
Thos. Rattray, Ada, Norman Co.  
Syd. Boyd, Canton, Fillmore Co.  
E. A. Baird, Graceville.  
Chas. Fritch, Chokio, Stevens Co.  
John Marth, Barnesville.  
J. A. McKay, Alexandria.  
Calvin Young, Lakefield, Jackson Co.  
T. F. Armstrong, Rochester.  
Thomas Rockford, Austin.  
Stephen Ryan, Barry Station.  
W. S. Clay, Hutchinson.  
Ernest Wickeriski, New Ulm.  
James R. Smith, Brainerd.  
G. G. Valentine, Brown's Valley.  
Fritz Heinlein, Lake Wilson.  
G. M. Scott, Sherburne, Martin Co.  
E. E. Cram, Blue Earth City.  
John P. Tuff, Fertile.  
F. A. Wassmann, Lake City.



Nilsson & Nordlander, Minneapolis, 104 Washington Ave.  
 J. H. M. Parker, Duluth.  
 J. E. Paradis, Campbell.  
 G. W. Randolph, Kimbrae, Nobles Co.  
 M. W. Sandquist, St. James.  
 P. W. Simpson, Hutchinson.  
 L. V. Stone, St. Peter.  
 Hy. G. Wyvell, Breckenridge.

Jacob Unger, Moorhead.  
 C. A. Ranson, Albert Lea.  
 Wm. Ross, Hardwick.  
 Enos Barbeau, Fergus Falls.  
 Chas. T. Grace, Morris.  
 James Kelly, Wadena.  
 F. G. Dennicliffe, Windom.  
 Peter Johnson, Fosston.  
 Z. Giroux, Crookston.

## WISCONSIN.

F. S. Baldwin, Waupaca.  
 A. W. Ballantyne, South Milwaukee.  
 Wm. Barr, Jefferson.  
 J. F. Clark, Rent Block, Oshkosh Co.  
 W. D. Corrigan, Plainfield.  
 P. Cress, Phillips.  
 R. J. Dugdale, Platteville, Grant Co.  
 W. W. Fisher, Ashland.  
 S. D. Forbes, Westfield.  
 Wencer Fox, Iron River.  
 C. Hallstrand, Prentice.  
 Frank Heidt, Portage.  
 A. L. Hellweg, Bayfield.

A. C. Hermann, New London.  
 C. M. Jelleff, New London.  
 H. C. McRae, Chippewa Falls.  
 John R. Means, Steven's Point.  
 A. B. Noble, Ashland.  
 J. Ross, Porter, Mt. Morris.  
 Samuel Shaw, New Richmond.  
 Stephen Plumley, El Paso, Pierce Co.  
 Thos. Fairbairn, Milwaukee, New Insurance Bldg.  
 Frank H. Hurd, Wabasha.  
 Hans. O. Erickson, Tomahawk.  
 D. McQuane, Hayward Sawyer Co.  
 John A. Flanigan, Junction City.

## OHIO.

C. T. Amsden, Greenwich, Huron Co.  
 F. B. Barber, Colebrook.  
 J. C. Biglow, Bostwick, Geauga Co., box 23.  
 G. W. Carter, Osborn.  
 Wm. Gates, Toledo, 403 Madison St.  
 E. B. Gorsuch, Springfield.  
 H. C. Long, Cleveland, 127 Herman St.  
 C. W. Mordoff, Columbus, 203 North High St.  
 W. M. Morlan, E. Liverpool 421 Lincoln Ave.,  
 Columbiana Co.  
 Ellsworth Mosier, Chesterhill, Morgan Co.  
 Frank E. Moore, Alvada, Seneca Co.  
 Frank Mosier, Chesterhill, Morgan Co.  
 John H. Nigh, New Washington, Crawford Co.,  
 box 12.

W. S. Sears, Sidney.  
 Gamble Shields, Marysville.  
 A. J. Sims, Kent.  
 Jas. M. Smith, Bloomville, Seneca Co.  
 Thos. Shanyfelt, Dixon, Van Wert Co.  
 C. S. Wallace, Moark Centre.  
 E. G. Wickersham, Grover Hill.  
 Willard S. Weaver, Germantown, Montgomery Co.  
 Jno. M. Willemann, Florida, Henry Co., box A.  
 Geo. A. Whitney, Toledo, 205 Spitzer Bldg.  
 E. J. Reeves, Higginsport, Brown Co.  
 C. J. Nelson, Kent.  
 E. H. Sills, New Comerstown.  
 C. B. Johnston, Van Wert.  
 Albert Pickering, Columbus, 199 North High St.

## IOWA.

John Bellings, Gowie, Webster Co.  
 N. Bartholomew, Des Moines, Polk Co., 306  
 Fifth St.  
 Elmer Bruce, Laporte City, Blackhawk.  
 C. H. Christianson, St. Ansgar, Mitchell Co.  
 Geo. Thompson, Boyden, Sioux.

A. J. Tuttle, Clear Lake, Cerro Gordo.  
 J. T. McFee, Lennox, Taylor Co.  
 H. A. Hanson, Estherville, Emmett Co.  
 G. B. Byer, Hartley, O'Brien Co.  
 P. S. Kortrig, Manchester.

## SOUTH DAKOTA.

Jas. A. Brooks, Watertown.  
 C. S. Doolittle, Ipswich, Edmunds Co.  
 Frank Hart, Frankfort.  
 J. W. Keating, Clark.

John Sorenson, Redfield.  
 J. Trenholm, Henry.  
 J. Heinz, Mission Hill (or Volin).

## NORTH DAKOTA.

Wm. Ritchie, Grafton.  
 J. W. Sauntee, York.

Rev. F. A. Muller, Cathay, Wells Co.

## MISSOURI.

B. O. Mousees, Sedalia.  
 David Jamieson, Tiff City, McDonald Co., tem-  
 porary employment.

J. G. Lincoln, Kansas City, temporary.  
 Geo. H. McQueen, Carrollton.  
 Percy P. Smith, Kansas City.

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## TEXAS.

Louis Lund, Olivia, Calhoun Co.

E. Barrett, Houston.

## NEW YORK.

R. W. Chamberlain, Brighton.

## INDIANA.

P. B. Bolinger, Shipshewana.  
Everett & Kautz, Fort Wayne.National Real Estate Co. Rooms, 30, 31 & 32,  
Tri-State Bldg.

## IDAHO.

J. B. Anderson, Idaho Falls.

## CALIFORNIA.

C. J. Nelson, Kingsburg, Fresno Co.

Gardner & Thomley, San Francisco, 332 Wash-  
ington St.

## KANSAS.

Willis Kesler, Salina.  
J. A. Brogan, St. Pauls.James Como, St. Joseph.  
Chas. F. Soper, Medicine Lodge.

## NEBRASKA.

J. J. Barge, Beemer.  
Wm. J. Pease, Beatrice.  
A. S. Fielding Lincoln.D. R. Buck, Omaha.  
G. F. West, Omaha, 1401 Franam St.

## PENNSYLVANIA.

A. W. Alexander, Burnham.

Saml. Dunseith, Pittsburg, Room 74, 339 Fifth St.

## WYOMING.

Jas. McCorkle, Barrett, Crook Co.

## ILLINOIS.

A. M. Guittard, Arthur.  
W. R. Perty, Ashton.Jos. Garney, Harvey.  
Rev. Father Bourassa, Pullman.

## ONTARIO.

Rev. R. A. Burriss, Bowmanville.

Oliver B. Stockford, Rat Portage.

## NORTH-WEST TERRITORIES, (U.S.)

H. L. Briggs, Olds, Alta., Eastlohs Rancho.

## UTAH.

Alan Wakeling, Robinson, Juab Co.

J. W. Taylor, Salt Lake City.

## MASSACHUSETTS.

H. E. Sweet, Boston, 410 Tremont Bldg.

## COLORADO.

Jno. G. Hall, Denver, Colorado, 839 32nd St.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, June 13, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 11 o'clock a.m., Mr. McMillan, Chairman, presiding.

Mr. Frank Pedley, Superintendent of Immigration, was present at the request of the Committee and was examined as follows:—

*By Mr. Wilson :*

Q. Since the last meeting have you got the days in which Mr. Crawford and Mr. Rogers were travelling, any further information with reference to that?

A. No, I have not gone over their statements of disbursements at all since that time.

Q. No, it was the number of days they were engaged travelling and the number of days they spent in their offices?

A. Well, the information as to that, as I told the Committee a few days ago, would be obtained from a perusal of their monthly accounts showing disbursements, where made and on what account.

Q. I understood you to say their reports were not made in that form, that they thought they complied with the regulations, but not in the letter; I thought you might have got something since?

A. Well, I have received a diary from Mr. Crawford since, which is a memorandum book showing his movements during the year.

Q. Well, that is not satisfactory. It does seem to me the gentleman should do better than that?

A. And I told the Committee if I went through the correspondence on the file I could get that.

Q. You could not be expected to do that. It does seem to me the gentleman should do that; the other agents have done it?

A. Yes.

Q. Could you get us that information without too much trouble?

A. I will endeavour to get it. In Mr. Rogers's case I think it is impossible.

Q. Is this report for the fiscal or calendar year?

A. Which report?

Q. Of your Department, your branch?

A. For the calendar year.

Q. Is that for the part belonging to the Immigration branch? Is it for the fiscal year?

A. No, I think the homestead report is.

Q. I think your report starts out by saying it is for the fiscal year?

A. No, but if it is, it is a mistake; it is brought down to the end of the calendar year.

Q. Then some of this report is for the fiscal year and some for the calendar year?

A. The whole of the Immigration report is for the calendar year.

*By Mr. Clancy :*

Q. It would take in a part of the fiscal year?

A. That part which falls within the calendar year.



## APPENDIX No. 1

CORRESPONDENCE *re* AGENTS IN THE UNITED STATES.

When the Committee rose last day I was putting in a statement and was asked by one of the members, Mr. Clancy, I think, to have that extended so as to show the number of agents employed in the United States, their salaries and expenses, the number of homesteads entered, and the number returned as being sent to this country. I was also asked to go back of 1892—I had the statement prepared, as the Committee will remember, for that period of time during which the work of immigration has been in the Department of the Interior, since some time in 1892; prior to that time it was in the Department of Agriculture—and in order to make the statement complete, I was asked to try to get the figures for the eight years previous to the bringing of our branch into the Interior Department. I regret to say that the information obtainable regarding that period of time is very meagre. I have made inquiries from the Secretary of the Department of Agriculture and I will read my letter to him and his reply.

“OTTAWA, June 12, 1900.

‘SIR,—For the information of the Superintendent of Immigration will you kindly inform me if your Department, when it had control of the immigration service, received from the Dominion Land Agents in the North-west and Manitoba, or from the Commissioner of Dominion Lands, a statement showing the number of homesteads taken up by the different nationalities. This information is particularly desired with reference to immigrants from the United States.

Your obedient servant,

P. G. KEYES,  
*Secretary.*’

In reply to that the following letter was received:—

OTTAWA, June 12, 1900.

‘SIR,—I have the honour to acknowledge the receipt of your letter of this day’s date asking to be informed if this department, when it had control of the immigration service, received from the Dominion Lands Agents in the North West Territories and Manitoba, or from the Commissioner of Dominion Lands, statements showing the number of homesteads taken up by the different nationalities. In reply, I have to inform you that there is nothing on record in this Department to show that any such statements were ever received by us.

I have the honour to be, Sir,

Your obedient servant,

A. L. JARVIS,  
*Secretary, Department of Agriculture.*’

I also had a note sent to Mr. Goodeve, the Chief Clerk of the Lands Patent Branch: ‘Will you please say whether any record was kept prior to May, 1891, of the nationalities of those who took up homesteads in Manitoba and the North West Territories.’ The answer was:—‘No record was kept prior to the date you mention of such data.’ There is nothing in the records, apparently, of the Department of Agriculture or the Department of the Interior furnishing the information as we have been able to give it since about 1892, and in that regard I am unable to comply with the request of the Committee. So far as the immigration movement is considered, apart from the evidence supplied by homesteading, there was in the annual report of the Department of Agriculture for the year 1891, a collective statement showing the number of immigrants from the United States from 1884 to 1891, a period of eight years. These immigrants came in through the following ports:

*By Mr. Wilson :*

Q. From 1884 to 1891 ?

Q. From 1884 to 1891.

Q. When did this immigration start ?

A. I do not know when it started ; it has been going on for years ; there has always been a certain movement of this kind.

Q. I do not make myself clear ; what was the earliest date we sent agents to that country ?

#### AGENTS IN THE UNITED STATES IN 1892.

A. So far as I can establish it, the earliest date we sent agents there was 1892.

Q. Do you remember the name of the first agent ?

A. No, I have the list of agents for that year and there were the following agents : J. P. O. Allaire, C. G. Caron, T. W. Child, S. R. Reed, W. H. Hall, C. O. Swanson, T. J. Waggoner, E. G. Wiswell, P. F. Daly, James Reilly, G. P. Bliss, Julius Siemens, James Anderson, A. R. Code, W. J. Cresshwaite, William Davis, A. F. Holmes, M. V. McInnis, R. McKay, H. S. Scatchard, W. B. Williams, C. A. Munson, E. W. McCrea, T. G. Pearce, C. Bebington, J. Calder, J. S. Crawford, A. E. Hethrington, H. H. Smith, Thomas Swan, S. Minaker, William Ritchie, Tim Curtin, E. E. Pettit, W. A. Webster, M. A. McLean.

*By Mr. Clancy :*

Q. You say, Mr. Pedley, there is no record in the Dominion Lands Office as to the nationalities ?

A. Well, that is the statement I have received from the clerk in charge.

Q. Is there a record of nationalities now in the Dominion Lands Office, as I understand it, is as it appears in the annual report of the Deputy Minister where that appears. Here is Mr. Stephenson's report for the fiscal year, it does not agree of course from the calendar year overlapping it.

A. Mr. Stephenson has shown all that and reports the number taken.

Q. Now, where did Mr. Smart get this.

A. From Mr. Goodeve, the chief clerk of that branch, to whom all the entries are forwarded, and from these he makes up his statement which appears in the Deputy Minister's report. Mr. Stephenson of course makes a certain report which appears here, but the fact that he does not give the nationalities is not to be taken, as I understand it as indicating that they are not given somewhere.

Q. Do you know as a matter of fact that the nationalities are given somewhere in the office ?

A. It does not come under my supervision in any shape or form, and of course I cannot say, positively.

Q. I was just asking as a matter of opinion, in view of the statement you made that there was no record kept of the nationalities in the Dominion Lands Office prior to 1891. What I wanted to get at was this, was there any system adopted at that period giving the nationalities, or if you have any information that there has been any change.

A. From a cursory glance at the correspondence, there were some letters passed, I think, between the late Deputy Minister of the Interior and the Secretary of the Canadian Pacific Railway Company somewhere about 1892, with a view of making a classification of the homesteaders, and if I am not mistaken, of the people generally coming into the North West.

Q. But you can't speak positively that this was so.

A. I am only speaking now from having read over a subject that I am not dealing with regularly in connection with my ordinary work, and as a result of that correspondence, I understand that that is the classification that was adopted.

Q. Is that your inference or do you speak from facts ?

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A. As I say that is not in my own branch, and I only deal with it as a report from the proper officers. I would not care to be positive about it. As I understand it, the individual land agents report monthly or weekly to the head office the number of homestead entries that have been made. These individual reports are compiled and tabulated by the officer in the Dominion Lands grant branch.

Q. From year to year?

A. From month to month.

Q. And do you know when that commences?

A. My impression is that it comes about 1892.

Q. But of course you are not certain about that?

A. Of course, as I said before, this not being my work, I do not profess to speak positively.

Q. Where does Mr. Smart get the information from which he makes up his reports?

A. He gets them from the heads of the different branches.

Q. At Ottawa?

A. At Ottawa. Mr. Goodeve is chief clerk and looks after the homestead entries which are made, and the reports are sent in to him; they are kept on record in his branch in order to enable him to deal intelligently with the patents. The patents are issued from his office.

Q. Yes, but he does not need the nationalities for that part of it. It must be kept for other reasons than that?

A. I am not in a position to say what the reasons are. It was done long before my time.

Q. Then would it not be well to deal with that and clear it up before dealing with the report that you are putting in here. If this is kept in the Dominion lands office, if they record the nationalities as far as can be known at the time of making the homestead entries, it is well we should know whether there is such information now in the Department?

A. I suppose the proper officer could inform you as to that.

Q. If Mr. Goodeve would come here he could give us the proper information which you have not?

A. No, I only take the report the same as you do. I asked: 'Will you please say if any report was kept prior to 1891 of the nationalities?' And he says: 'No report was kept prior to the date you mentioned.' If you turn up in the annual report of 1892 you will find it is kept there.

Q. Have you the annual report there?

A. No, but I have gone over the annual reports and find it there since that time.

Q. In 1892?

A. Yes, in 1892-3-4-5-6-7-8-9, that is of the homesteaders going there.

*By Mr. Wilson:*

Q. I would just like to call your attention again. I suppose the Deputy Minister presides over the whole Department—does he not?

A. Yes.

Q. Here is what he says in his report: 'As in former years, the report covers all the operations of the Department to the end of December 31 last, with the exception of the financial returns, which have only been brought down to June 30, 1899, as is done in other Departments of the Government service.'

A. Yes.

Q. So this would be the calendar year and not the fiscal year that these reports are for?

A. I say our report is for the calendar year.

Q. The whole reports you say? Some of it is for the fiscal year?

A. With the exception of the financial portion.

Q. Yes, but they do not give us the amounts they have spent, do they?

A. That appears in the Auditor General's Report. The accountant of our Department has an annual report in the Report of the Interior.



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Q. I think it is unfortunate that it is not changed, because I do not see why all the Departments should not be alike. I know you are not responsible for that?

A. The accountant of the Department has a report in there, and I presume he deals with the financial affairs.

Q. What is his name?

A. Mr. Beddoe. I think that clears up that matter.

#### IMMIGRANT ARRIVALS FROM THE UNITED STATES, FROM 1884 TO 1891.

I was dealing with the immigrants that were reported by the Agricultural Department from the year 1891, which covered a period of eight years prior to that time, from 1884 to 1891 inclusive, and the number of arrivals as reported as entering at the ports of Coaticook, Ottawa, Toronto, Kingston, London and Prescott, which are as follows:—

1884.....	2,970
1885.....	1,873
1886.....	1,946
1887.....	3,166
1888.....	1,865
1889.....	2,794
1890.....	2,035
1891.....	2,076

These are taken from the Department of Agriculture reports, and cover a period of eight years. This is the only information I have been able to obtain as to the movement from the United States to this country during this period of time.

#### APPROPRIATIONS, AGENCIES AND EXPENDITURE IN THE UNITED STATES FROM 1892 TO 1899 INCLUSIVE.

*By Mr. Clancy:*

Q. In any other reports is there any information as to the number coming from the United States?

A. Not in any that I have been able to get hold of.

Q. And before you go any further, did you examine the reports of immigration for these years?

A. Yes, I have gone through the reports on immigration and pretty nearly through every report where I thought it might be obtained. Of course we were in no doubt about what took place in the Department of Agriculture, we wrote to the official correspondent of that Department, the secretary, and have received from him a letter which practically settles it as far as we are concerned, although before writing we went through the reports to see if there was any information obtainable along this line. In order to remove any doubts that might be in our own minds, we wrote to the secretary and received the letter I have read.

In 1892-3, the total appropriation was \$177,604.82, that is for immigration expenditure, the number of salaried agents—

Q. What are you giving now, from the United States?

A. Yes, I am giving you the United States work.

Q. Can you give us the expenditure in the United States each year with the work classified.

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A. Yes, I am giving the year, the agents, the salaries, the allowance and expenses, homestead entries and the number of souls reported.

Q. And the expenditure in the United States.

A. Yes, the expenditure for these purposes.

The number of regular agents in 1892-3 was 48, salaries \$20,626.51, the allowances at so much per day which you will see in the Auditor General's report \$15,327.52, and expenses such as railroad fare, postage, telegrams, and so on, \$16,075.18, total expenditure of \$52,029.21. The number of homestead entries reported that year 513, and the number of souls estimated by the agents themselves 1,161.

In 1893-4 the appropriation was \$180,677.43; the number of regular agents 39, salaries, allowances and expenses, \$46,294.92; homestead entries 818, number of souls as reported by the agents 551.

In 1894-5 the appropriation was \$202,235.52, the number of agents 9, the salaries \$3,374.66; the expenses \$4,934.53, a total of \$8,609.19; the number of homestead entries 558, and the souls reported 629.

*By Mr. Wilson :*

Q. Five hundred and how many entries?

A. 558.

Q. And only 600 people?

A. That I mean is checked off by the agents themselves. So many crossing the boundary lines. These are the estimates of the agents working in the United States.

Q. You estimate that every homesteader is equivalent to three and one fifth persons?

A. About that.

Q. That estimate would be only about one and one fifth?

A. The estimate of the agent is not based on the homesteads at all. He knows nothing about that. I am giving the number of homesteads as taken from the official documents, and the number of souls as estimated by the agents, is taken from their own reports. It does not follow that these two must be taken together.

Q. It must follow that almost every person who came in under that estimate was a homesteader?

A. Not necessarily, because some of the people who came in and would be counted by the agents might go to the older provinces.

Q. Five hundred homesteads, and only 600 and some odd settlers?

A. There is no doubt in my mind that the 627 souls that the—

*By Mr. Featherstone :*

Q. That is '91, '92, '93, '94 and '95 before you had anything to do with it?

A. Yes, all down to 1895, the end of the fiscal years.

In 1896, the appropriation was \$127,438.14, nine salaried agents in the United States whose salaries aggregated \$2,860, and expenses \$4,528.34, total expenses \$7,388.34; number of homestead entries 190.

*By Mr. Wilson :*

Q. And how many immigrants?

A. There were no souls reported that year; there were no estimates given by the agents that year at all.

Q. What year?

A. The year 1895-6.

Q. Well there were not any farmers coming in evidently?

A. No, they appear to have fallen off considerably.

*By Mr. Featherston :*

Q. The people were leaving the country about that time?

A. They evidently were not coming in.

In 1896-7 the total appropriation was \$127,438.14, the agents 12, salaries \$5,130.30, expenses \$6,041.34, total expenses \$11,171.64, the homestead entries 218, and number of souls reported 1900.

*By Mr. Wilson :*

Q. That is for 1896-7 is it?

A. That is for 1896-7.

In 1897-8 the appropriation was \$261,194.90; 16 regular salaried agents, 13 special agents.

Q. In the United States?

A. In the United States.

Q. Sixteen?

A. Sixteen salaried agents.

Q. I must put that down because that is very different from what the Minister said in the House, how many salaried officers?

A. Sixteen.

*By Mr. Carscallen :*

Q. How many special agents?

A. Thirteen special agents. I have the details of these here. These were sent down for two or three months.

*By Mr. Wilson :*

Q. They were paid were they?

A. They were paid.

Q. Regular salaries?

A. Regular salaries. A good many of these were employees in the West who in the slack months were sent down to the United States to work with the regular agents there, and we charged that work up of course to the United States expenditure.

The total for salaries that year is \$14,884.90, the total expenses \$28,314.57.



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*By Mr. Wilson :*

Q. You had more regular salaried agents then than you have now, didn't you in the United States?

A. Just about the same, we have 14.

Q. I think you gave us ten?

A. Well——

Q. Ten is what I have down as copied from your report. That is your evidence?

A. We have four or five agents who reside in Canada, but who do part of their work in the United States, and for the purpose of doing justice we have to classify them to a large extent as United States agents, but for the purposes of my examination here in the earlier part, they were properly classified as belonging to the head offices at Ottawa.

Q. What you gave us on your examination before on the 23rd of May was ten regular salaried officers working in the United States. You brought down the days they travelled, you brought down the days in the office, all except two, who had not reported up to that time?

A. Well there is for instance Mr. Swanson, Rev. Father Gouin, Rev. Father Blais, who were paid salaries. They live in Canada and report to the head office, and that explains the difference in the classification. A good deal of the work done by these men will be in the United States, and so it is only fair to charge it up to the United States.

Q. Can you give us how many days they spent in the United States for the year, how much time you know? If you have agents living in Canada, whose business is in the United States, I think we should have the statement?

A. They are not working in the United States, they are not supposed to be.

Q. That is another reason why we should have it, because they would properly belong to the vote for that purpose for the expenses of that branch?

A. The appropriation has to be adjusted of course to meet the facts.

Q. Well, I think we ought to have all that information.

A. Yes, I can give you detailed reports showing the movements of all these men. Swanson, Blais and Gouin have reported. There is no trouble about that, I could attach to the report here where these men are, but my reason for making the classification I did in the earlier part of my examination, was that I was dealing with the agents in the States residing there all the time. These other men reside in Canada and do some work in the States.

Q. But you must know this committee wants to know all the expenses in connection with the United States and the Old Country. Now, I think you ought to be able to give the days travelled in the United States and the Old Country?

A. I gave that the other day.

Q. I understood you were not able to do that.

A. I went over the places they visited.

Q. Next year, I think you ought to give us that information.

A. I could not give it in the terms Mr. Clancy asked.

*By Mr. Clancy :*

Q. That statement was not put in at my request at all.

*By Mr. Wilson :*

Q. But he is now giving a statement of other agents than he gave the other day who are regular salaried agents doing work in the United States, and I brought up the question that he ought to be able to give us detailed statements of the agents in Great Britain and the Continent and the number of days travelled the same as in the States. We ought to have all that information.

A. There is no doubt, I am trying every year to perfect the system of getting that. With a large staff and a large expenditure we should be able to put our hands on the movement of every officer.

For 1897-98, the salaries amounted to \$14,884.90, personal expenses to \$28,314.57, and the total for salaries and expense is \$43,195.47. The number of homestead entries reported was 698, and the number of souls reported 9,119.

In 1898-9 the total appropriation for immigration work was \$255,878.88. There were fourteen salaried agents.

Q. You are speaking now of the fiscal year, not the calendar year?

A. Yes.

Q. Could you give us an idea of what you spent that year, 1899; you have got it there, I suppose?

A. No, I have not got it; I think we may have overrun the appropriation a little.

Q. According to your own statement you did; \$392,000.

A. I think when I gave you that I told you the two fiscal years overlapped.

Q. I think you will find the Auditor General will bring it about the same, a little more perhaps.

A. Well, whatever the expenditure for the calendar year, the statement I made where I divided the work to show the total expenditure was qualified by the further statement that the appropriation of course lapsed at the end of the fiscal year, and my statement gave the calendar year, so that the two would overlap.

Q. But you will remember, I went over it with you the second time so that there would be no mistake.

A. The figures I gave you were taken from the accountant, who told me they would be approximate, and I gave them to the Committee the same. It is difficult to say how much should be chargeable to one year, and how much to another.

Q. You, as Superintendent of Immigration, should try to have this changed. Can you tell what you spent this year? I can tell you that the appropriation was \$360,000 last year, and your Minister came down to the House the other day and asked for \$75,000 more, making \$435,000 for this year, which he claims was spent. Now you could tell us what was spent last year; my recollection of what you gave was about \$392,000?

A. The appropriation for the fiscal year was \$255,878.

Q. Yes, and the Auditor General shows the same expenditure, but when you came to give us the figures they were different. I will read your evidence so as to be quite fair. You said on May 4, in your evidence, that you paid in commissions to United States agents \$1,653, and on page 2 you said that you expended in the United States \$83,500, in Great Britain, Ireland and on the Continent \$80,000, and in Canada for all purposes \$224,363, and if you put them all together I think they will come fully up to the sum I have stated.

A. I was especially clear to state to the Committee that would be the cost approximately, but inasmuch as that division was given for the calendar year two portions of the fiscal year would overlap.

Q. Now, here is the other side: the Minister has already got \$435,000 for the present year, and in answer to a question gave the expenditure last year as \$395,000, showing that in all probability the statement you have made is just about correct. You are continually increasing the expenditure, and what we want to know is the result you get from it?

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A. In the year 1898-9 the total appropriation for immigration purposes was \$255,878.88, the number of salaried agents in the United States was fourteen and special agents 9, the total expenditure for salaries was \$14,233.01, the expenses were \$26,124.64, a total of \$40,357.65. The number of homestead entries reported was 1,169, and the number of souls reported was 11,945.

Now, this is the detailed statement showing every one of the agents and their individual expenses for the period covered by that general statement.

Q. Is that to be published with the report of this committee?

A. I hand it in, and if the Committee wish it to be published, it will be.

*By Mr. Clancy :*

Q. How is this, you have left out the other expenses?

A. Which other expenses?

Q. Well, you have given here you see—I understood this was to include all the expenses in the United States, and you have only put in \$40,357.65, only shown part of the expense which was \$83,500, as Mr. Wilson pointed out?

A. This is all the expenditure, these men only spent that.

Q. You say that the amount is correct?

A. The statement was to show the number of men employed and the expenses of each man.

Q. The expenses in the United States, this is only a portion of that.

A. That is the total expenditure of these men.

Q. Don't try to invent misunderstandings. I understood what we wanted was the total expenditure in the United States for these years?

A. No, for all these years I gave the expenditure as asked for by Mr. Wilson, showing the total expenditure in Canada, the United States, and the Old Country, but this statement was to show the number of agents employed in the United States and their expenses.

Q. It was to show the number of agents, salaries, expenses, number of homesteads, and the general expenses in the United States for each and every year. It might or might not be exceedingly misleading to do that, because as you know —

A. The general expenditure was never mentioned.

Q. Well, we must have the general expenditure. Here is a place to put it down here.

*By Mr. Wilson :*

Q. Would you not suggest that the statement be taken back and give us all the information?

*By Mr. Clancy :*

Q. I think, it is a very good table and should form a part of the report? I suppose that will be a very easy matter to make the addition that I ask, will it not?

A. I do not know. I am sure, I have not gone over the expenditure to see how the general expenditure has been made up, but it is a matter that I suppose the records will show.

*By Mr. Wilson :*

Q. It would not be much trouble to do that?

A. I think there would be quite a little work about it.

*By Mr. Clancy :*

Q. Any clerk will get it out in an hour?

A. Any clerk will not get it out in an hour, because there is considerable work; for instance, take the item you have just passed. We purchased 200,000 atlases in the United States, the expenditure on these atlases appear in the Auditor General's



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report as being made in the United States. They cost somewhere in the neighbourhood of \$6,000, but the circulation of these atlases took place both in this country and in the Old Country.

Q. Well, you have the number sent to the Old Country and the number sent to the United States?

A. Well, if you wish me to go over all the accounts and dissect all the items it will not be done in an hour or two.

A. No, I do not want the items, but I say if there is any system at all in the Department, and I am going to assume that there is a very good system, they will be able to tell by the records how many of these atlases were sent to the United States and how many to other countries.

A. There is no doubt they have on record the bill of lading showing the consignment sent to each country.

Q. They have surely a better record than that?

A. They can show how many were shipped to the United States and how many were shipped from the office here to other countries.

*By Mr. Carscallen:*

Q. Supposing it would take two hours?

A. It will take more than two or three hours; it will take a man two or three weeks in order to dissect the accounts in that way.

*By Mr. Clancy:*

Q. Surely it will not take two or three weeks to dissect the expenditure in bulk, in order to be able to give this information. That is a very extraordinary statement, and if that is the condition of things in the Department it is deplorable if they cannot tell us at very short notice the amount spent each year in the United States. It is a very disgraceful state of affairs, but I do not place the responsibility on you, Mr. Pedley?

A. I do not take that to myself at all, because the further we go back the worse it gets. Go back eight or ten years, and there is probably no system of classification at all. All these statements are made up from the Auditor General's reports, because he has it classified. For instance, in his report for 1899 you will find our Department is charged \$6,000, I think it is, for 200,000 atlases. Now probably, one-half of these atlases that were charged to the United States, but it is not fair to charge to the United States entirely, as all the atlases were not used there.

*By Mr. Clancy:*

Q. When you give us a statement of so much to the United States you say only a fair share was charged?

A. No, no, I gave you only the actual money spent in the United States, but I told the Committee on a previous occasion that the Committee would recognize the difficulty of saying what money was properly charged to the United States because some disbursements there would cover, literature that was distributed either in Canada or in Europe—literature that we purchased in the United States, that could not be paid in Canada, and that was sent to other countries.

*By Mr. Wilson:*

Q. You do not need to get down to a dollar but a general statement that will be approximately correct.

A. To ask me to dissect the general expenditure in the United States for a period of ten years, I want to say, I think I will hardly be a position to give that for some time because it involves a fearful amount of work going over these accounts for the last ten years.

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*By Mr. Clancy :*

Q. You quite understand that for any number of years it would be quite misleading to give the work without giving at the same time the total expenditure in that country!

A. I am giving a comparison along the same lines.

Q. But only a comparison of certain expenditure?

A. Of salaried agents and their expenses.

Q. Yes, but there may be other expenses, so we should include the whole thing, including the salaried agents as naturally a part of it.

A. The salaried agents and their expenses and allowances was what I was asked for. This is the first time it has been mentioned to me to bring in a statement of the total expenditure.

Q. Will you undertake to get that?

A. I will undertake to get it, to go to the proper officers and do the best we can. This is all I can do.

Q. I do not want a part of it filed unless we can have the whole information. I do not think that on either side we take much pride in concealing the mistakes in the past. We are now burying the past, but this statement is put in with a view—and I am not going to complain of that—of showing the work by comparison for a number of years; but I want a complete statement, and I object to anything being filed until the statement is completed.

*By Mr. Wilson :*

Q. I think, Mr. Pedley himself will see the advisability of making that statement complete, and after we have it put in, this year, we can continue it from year to year.

*By Mr. Featherston :*

Q. You are making a statement according to the instructions you had?

A. Yes.

*By Mr. Clancy :*

Q. There were no instructions as I understand it. It was brought here first, and I suggested other information with regard to the expenditure.

A. Well, all I have to say about that is that this statement I bring to-day is a statement which I think the evidence shows was the one asked for at the last meeting.

*By Mr. Wilson :*

Q. Even if that is true that is no answer why it should not be improved if it can be. Even if it complied with what we asked for, we want other information to make it complete and I think there should be no objection to giving it.

*By the Chairman :*

Q. I would just say you had better make your wants as brief as possible as the Government intends at an early date to take the mornings and you will have few meetings then.

*By Mr. Wilson :*

Q. It might be fixed up and put in the report.

The CHAIRMAN.—If the Committee agreed a certain statement should come down and this statement was brought down in accordance with the order of the

Committee and laid upon the table and then when that statement was read it was asked that an enlargement of it should be made, I do not think I would be justified, as Chairman, in throwing out the original statement.

Mr. PEDLEY.—Of course it arose in this way. At one period of the examination, when I was dealing with the United States work, one of the members of the Committee referred to some of the officers and asked me what salaries they were getting, their expenses and asked me if I did not think that one of these men was being paid too much and that his expenses were pretty high. This opened up the question of what the usual salary and living expenses of an agent in the United States had been, and I gave in a very general way, that day, the salaries and expenses for one year, so that now, following that, I bring down a statement covering the salaries and expenses for the years 1892, down to 1899. Then, as I understood Mr. Clancy, he said, 'if you are going to do that you should go back further and show the same thing prior to that time and in addition to that the number of homestead entries, and if possible the number of people who came in.' I have followed out, as I think with absolute accuracy, the suggestions of Mr. Clancy, that I should make the comparative statement go back as far as the records will allow. That I have done, and the question of the general expenses was never discussed at all. The agent was getting so much for salary and so much for expenses, postage, etc., and I was asked if I did not think it was a good sum for a man of his calibre to be expending. Then another member asked something about it and I said the question had been up for some years, and in going into it I thought it fair to bring in to the Committee what had been done for eight or ten years in the Department, and then on Mr. Clancy's suggestion I went back as far as I could.

*By Mr. Wilson :*

Q. What objection can there be to giving the whole thing? Why should you object to make up that table so that it would be complete and the record be followed out for all time? It does seem to me that this is a reasonable request and I don't think any member of the Committee will object to it.

The CHAIRMAN.—I see no objection if it can be arrived at. The Committee should consider fully any statement that they require and give Mr. Pedley a note of it, because if you go on increasing and widening the inquiry from time to time, you will never come to any conclusion.

*By Mr. Rogers :*

Q. I think, Mr. Pedley, that the Department should take more active measures to get agricultural labourers for Ontario. I think that should be followed up in getting immigration in foreign countries, because I believe we want seriously agricultural labourers in this country.

*By Mr. Wilson :*

Q. Did you read the report?

*By Mr. Rogers :*

Q. Yes.

*By Mr. Wilson :*

Q. Did you notice how hard it was to get that class in the Old Country?



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*By Mr. Rogers :*

Q. But even if they can't be got I think we would be willing to get them from the European entries, both male and female. I think, too, there should be no unjust restrictions put on child labour coming in from these homes. There has been some adverse criticism about them, but on the whole it has been of benefit. In many sections we cannot have anyone, but these children, to help us and the rising generation on the farms in Ontario. We hear a lot of complaints from the labour organizations but none from the country districts where these children are needed and where farm labourers are needed.

A. Well, there is no doubt about there being quite a demand from time to time, so far as I can ascertain by conversation with gentlemen I meet in the country, for agricultural labourers, although the Department, as I stated one time in my examination, is not in receipt of a great many formal communications. But I can easily understand from conversation with farmers there is a need for agricultural labourers, and we classify all farm labourers as agriculturists in our report.

The Committee may like to know that so far this year the homestead entries from all classes are showing a gratifying increase.

*By Mr. Clancy :*

Q. Well, we can only deal with the former years. You understand, Mr. Pedley, you will make your whole statement now. As far as I asked it will take in all the periods as far as you can get it.

A. Yes, I understand.

Having read over the preceding transcripts of my evidence of April 25, May 24, 11, 23, June 1, 6, 8, 13, I find them correct.

FRANK PEDLEY,

*Supt. of Immigration.*



## EMIGRATION PROPAGANDA.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
May 9, 1900.

The Select Standing Committee on Agriculture and Colonization met this day ;  
Mr. McMillan, Chairman, in the chair

The CHAIRMAN.—We have Mr. Preston before us to-day and we will now hear him.

Mr. W. T. R. Preston, Inspector of Immigration Agencies in Europe, was examined as follows :—

Mr. Chairman and gentlemen of the Committee,—I am at a loss to know just where I should commence saying anything in regard to the immigration work in Europe.

*By Mr. Wilson :*

Q. I would suggest that you give us your instructions from the Department first, and then tell us what particular position you have, as to whether you are inspector or agent, and what control you have over the agents.

A. I think it might be as well to read my instructions in the first place and that will open the avenue for special inquiries. My letter of instructions is dated at Ottawa, February 24, 1899, addressed to myself, and is as follows :—

‘DEAR SIR,—In connection with your appointment as Inspector of Immigration Agencies in Great Britain and Europe, I beg to make the following suggestions :—

‘On your arrival in England I think it would be advisable for you to proceed immediately to the office of the High Commissioner (to whom I am sending a letter advising him of your appointment), for the purpose of examining the work that is done in his office, as well as their methods of adjusting accounts, paying salaries, &c. The reason for this, I may explain, is that in the performance of the duties of your office the matter of accounts will possibly be one with which you will have much to do, so as to gain information as to the work that is being done and also as to work which you may think ought to be done to advance the interests of emigration to Canada. After familiarizing yourself with the work of the High Commissioner's office, you should also visit Liverpool, Glasgow and Dublin, so as to gather similar information as to the work which is being done by our agents at those places. Letters have also been addressed to Messrs. Mitchell, Murray and Devlin, advising them of your appointment and of your proposed visit to their respective offices.



'You will understand, of course, that much of the work of inducing emigration to Canada in the Old Country and in Europe falls upon the steamship agents who receive a bonus for each ticket that is sold. You must therefore make it a point, wherever you visit, to come in touch with the steamship agents, and endeavor in every way to incline their efforts to Canada rather than to other countries. The matter of bonuses paid to them is one which you will have to discuss with the High Commissioner and the general agents of the Department, as well as the steamship agents themselves where you think it desirable to do so. The amount now paid may be considered as insufficient in view of the determined efforts now being made by some of the Australian colonies in the way of assisted passages, &c. I have already written to the High Commissioner on this subject, a copy of which letter you may see in the Immigration branch of the Department.

'It is quite desirable that the Department should receive a short report from you, say weekly, as to the progress of your work, with such suggestions that you may wish to make which would further the efforts we have in view.

'These instructions, which apply to Great Britain and Ireland generally, apply to the Continent of Europe as well, our work in the latter countries being largely with the steamship agents. Of course, it will be necessary for you to visit the various agencies of the Department in France and Belgium, and also to call on Professor Oleskow, at Lemberg, Austria.

'You will understand that it be necessary for you to exercise great care in the conduct of your work in many of the European countries, and I do not think that it will be necessary or advisable that you should undertake any direct work yourself in Germany, or in any other country where there are restrictive laws in force regarding emigration, as it might raise difficulties and complications which it might not be easy afterwards to adjust.

'I think you should also visit Hungary, Denmark, and possibly Sweden. I do not think that there is any objection to any work being done in Denmark. I understand that there has been some difficulty recently with regard to Danes in Germany and there is some talk of their moving away. This is a matter which should also receive your attention.

'It will be necessary for you further to look into the case of criminals who were sent over from Copenhagen some time ago. It would appear that the police authorities at that place purchased tickets for these criminals and had them shipped to Canada. This proceeding, of course, must be stopped, and if necessary stringent measures will have to be taken in order to prevent its recurrence in the future.

'I should also mention that the matter of advertising is one about which you should consult the High Commissioner, and no doubt after you have visited the various districts in Great Britain you will be able to report as to the best methods of reaching the people in the way of advertising Canada. Various schemes have been suggested to the Department, from time to time, in this connection, but nothing definite has been done with regard to it.

'You are well aware, no doubt, that ocean passage rates have very much to do in determining the current of emigration from one country to another, and it would be wise for you to examine into the various routes taken by persons who emigrate, both by rail and water, so that you may be able to fully advise persons with whom you may come in contact. I would be glad, therefore, to have you call on the different steamship companies doing business in Canada, so that you may keep yourself fully in touch with them, and gain information which you may be able to use to advantage.

'I think that by the time you have visited the various parts that I have designated that you will be in a position to advise the Department as to what may be necessary to even more successfully carry on our emigration business in the Old Country and Europe.

'I inclose you herewith a letter of introduction to the High Commissioner, who will no doubt be in a position to give you valuable information with regard to the nature of your work and as to the means which should be taken so as to ensure the best results possible. The important thing of all is to turn the tide of emigra-

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tion towards Canada, and to make every effort to induce persons who contemplate moving from their old homes to settle in this country.

'You will receive your salary and expenses through the High Commissioner's office, and it is fully understood that you should confer with Lord Strathcona on all matters connected with your work.

Yours truly,

(Sd.) JAS. A. SMART,  
*'Deputy Minister.'*

*By Mr. Sproule :*

Q. Who were you to report to ?

A. I was to report to the High Commissioner, and through him, of course, to the Department at Ottawa. I don't know whether it will be necessary for me to go into a detailed account of my visit to the various places referred to in my report to the Department.

On my arrival in London I spent several weeks reading the files connected with the emigration work and looking into the accounts, securing an insight into the mode of carrying on business with a view to, if possible, finding out everything suggested or proposed to the Department from time to time in connection with emigration work not only in Great Britain but on the Continent. I found everything there in convenient form and every facility was given to me by the officers in charge for my becoming thoroughly acquainted with the routine of the work.

*By Mr. Wilson :*

Q. That is, our own officers ?

A. Our own officers acting, of course. The High Commissioner, at my first interview with him, expressed his pleasure that some one had been sent over there to assume the particular duties which I was specially charged with. I visited the offices at Liverpool, Glasgow, Dublin, Londonderry and Cardiff, interviewing the agents there as to their mode of work. I found that the work was going on then just about as it had been for 15 or 20 years.

Q. Excuse me, you did not tell me what your authority was with reference to agents ; your letter does not state.

A. I took it from my letter of instructions and also from the statement of the High Commissioner, as well as from conversations with the Minister and the Deputy Minister, that I was to supervise their work and advise with and make suggestions to the High Commissioner, and, if approved by him, to make changes in the mode of carrying on the work in Great Britain—I am referring now particularly to the work in Great Britain. I found on inquiry at our offices, at each one of which I had an opportunity of going over their correspondence and inquiring into their work very carefully, that the work was going on largely on the identical lines that have been in operation for a number of years, that is—the delivery of lectures with the aid of lantern slides, the attending at fairs, and the hiring of booths where—

Q. Give us the description of these slides ?

A. The slides are, of course pictures of various parts of Canada, particularly of the North West, although views of the older provinces are also thrown in, of farm life in its various stages, giving views of the early settlements of the country, and then later on, and directing the attention to the progress that has been made, more particularly in the newer parts of Canada, during the last two years. I found that a great many inquiries were being made, both at the London and Liverpool offices, by lecturers desiring a selection of slides for the purpose of illustrating their addresses upon Canada from time to time, and among the correspondence, almost invariably, there was a request not to forget to throw in a few pictures of Indians,

snow slides, winter scenes, ice palaces, and things of that kind. I took very strong ground against that from the beginning, and I think now that every slide of that description should be simply broken. The appalling ignorance in Great Britain in regard to Canada, is something, I am sure, members who have had the opportunity of visiting England, must have been more than impressed with, and I do not know that we are not, and now I am speaking generally, that we are not somewhat to blame for that. Every distinguished Englishman or nobleman who has come out here, in any capacity during the last 20 years has had himself photographed, and photographs of all his family, in furs and things of that kind to indicate that there is no season other than winter here.

*By Mr. Featherston :*

Q. That is to discourage immigration ?

A. I think, perhaps, it is rather to give the impression that they have had 'an experience' here and to satisfy curiosity, but you run up against that view practically everywhere. I may say that I think there is more dense ignorance in Great Britain about the resources of Canada, its climatic conditions, the wealth of its citizens, the social surroundings of its cities and towns, and its enterprise generally, than there is in the minds of people in any other country in Europe. I have reached that conclusion after a careful and unprejudiced survey of the situation. I may say just here, I found the same system prevailing, in the carrying on an emigration propaganda, as had practically existed for many years, the delivery of lectures, showing lantern slides and attending fairs. I had a long talk with Mr. Jury upon the subject, and I was pleased to find that he agreed with me that the time now is when some system should be introduced, from which the prospects of greater returns may be had for the expenditure of Canadian energy and money in Great Britain. The members of the Committee are possibly as conversant, if not more so than I had the opportunity of being previous to my appointment, with the reports of the agents. I take for instance, in Scotland, up to last year, I was very much struck, or very much impressed rather, with the extraordinary desire on the part of the agents there, to keep up what they thought a record in relation to lectures. If they failed during the winter season to deliver a lecture six nights out of the week they rather seemed to think that a record was being broken which was not at all creditable with them. I took the ground from the beginning that it would be far better to deliver two lectures a week and to stay in the town or village in order to have an opportunity of conversing with those who desired information about Canada, personally, and quietly, after they have possibly created an interest in Canada, than to deliver a lecture, arriving at the town or village late in the evening, and departing by daylight next morning for some other place. I refer especially to Scotland in this respect, and I found Mr. Murray quite disposed to take my view of the situation, and in regard to that, that a change should be brought about, and a change in that respect is now in operation in Scotland.

Reverting for a moment to England, where Mr. Jury has been more particularly charged with the lecturing business, and attending to affairs. I found, as I said a moment or two ago, that he had arrived at the conclusion that the time had come when really the expenditure of money and energy in attending meetings, judging by the results, did not justify the carrying out of that policy at any greater length. It has been very seldom, I have been told, that at these meetings there would be more than possibly a dozen or fifteen or twenty children with perhaps a half a dozen or less, half a dozen being the maximum, of adults that would be present at a lecture about Canada. The idea seemed rather to be that these lectures furnished a very good evening's entertainment for Sunday-school children, but outside of that, and in the larger circle we were desirous immediately of reaching, these opportunities of getting information about Canada were not taken advantage of. One of the reasons why I have taken the liberty of suggesting in my report to the Department that I think the system should be almost entirely changed in such a way that not only the



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agents in Great Britain, but elsewhere, should be placed in personal contact with possible enquirers, and in that way be able to follow them up with greater care than they have hitherto been able to do. Just upon that point I may say that the Canadian Pacific Railway, through Mr. Haslitt, as I learned subsequently, has followed out that policy for some time, that is on the line of personal contact with probable intending immigrants, and they have found it to work very satisfactorily. The returns Mr. Haslitt furnished me with in a general way, as to the results of his observations in that line, fully, I think, justified the conclusion I have reached, that we must do that kind of work in connection with the progress of emigration propaganda in Great Britain, with a view of having that idea carried out and of securing the assistance of the various steamship companies throughout Britain, I recommended to the High Commissioner when the advertisements were being prepared for the present season, that there should be inserted an additional line that information could be given not only about Canada at the High Commissioner's office and the Canadian Government offices, as had hitherto prevailed, but that there could be also information obtained at the offices of the Allan line, the Dominion line, the Elder-Dempster line and the Canadian Pacific Railway. I arrived at the conclusion that the interests of all the companies referred to are identical with those of Canada, and that a policy of that kind should be carried out.

*By Mr. Burnett :*

Q. Is there any Canadian in the High Commissioner's office to give information about Canada?

A. Allow me to finish this line and I will with pleasure give the honourable gentleman this information later. In that connection I made the recommendation to the High Commissioner, and there was in this year's advertisement inserted for the first time a few lines containing that information. Provision is also made by the same recommendation, that the names and addresses of all inquirers for information at the Glasgow, Liverpool, Dublin and London offices should be made out—the inquiries personally or by letter—should be made out and sent to the different steamship companies and the Canadian Pacific Railway once a week, and this makes a sort of—

*By Mr. Wilson :*

Q. Is that the number of inquiries at each place?

A. The names and addresses of every inquirer, either personally or by letter. The object I had in that was this: The steamship companies assured me if they could get that information they would send from their general offices to their booking agents throughout England, the addresses in their particular places so that the booking agent there—or the ticket agent as we understand the term here—in their respective localities would then look up these enquirers or prospective emigrants and continually keep in touch with them in that way; and in the same way the Canadian Pacific official, Mr. Haslitt, to whom I had referred, and who is the traveling agent of the Canadian Pacific, immediately on receipt of these letters—as he told me crossing the ocean a short time ago—places himself in communication with these inquirers from the London office, and where the distance is some length from London they do the same thing through the other offices throughout England, and in that way they keep in personal touch and contact with possible intending emigrants.

*By Mr. Clancy :*

Q. Pardon me, Mr. Preston, I want to ask you how many, if any, emigrants from England, Ireland or Scotland, come directly through the agency of our own agents there, or do they all in fact pass through the booking agent's hands, and do they get the bonus; are there any coming that do not pass through their hands?

A. That do not pass the booking agent?

Q. That the booking agents do not get a bonus for?

A. I should judge so, Mr. Clancy.

Q. Can you say how many?

A. No, I could not, but I made inquiries particularly in respect to agents from the north of Ireland. I had an opportunity of discussing that question with Mr. O'Kelly when there, and he gave me the names of some persons who were coming over second class and as saloon passengers, and on them he told me the booking agent would not receive a bonus. Of course for every passenger that is booked by a booking agent, he is not entitled to get this bonus. The bonus is only payable upon steerage passengers, as I understand it.

Q. You said a moment ago that the steamship companies were kept advised as far as possible with respect to inquirers, and that booking agents were after all the ticket agents of these companies.

A. They are.

Q. And that therefore any word done by our own agents would benefit them if they entered their hands and they would get these sums?

A. It might.

Q. It was directly; not it might.

A. Well, we cannot put it out of their hands. We must work with them.

*By Mr. Sproule :*

Q. Do you find the work of these company agents generally successful; are they apparently interested in the work?

A. I found some were not and others were.

*By Mr. Clancy :*

Q. Do they act for more than one company?

A. They practically act for all the companies; they are not like those here where the Canadian Pacific has its own agent alone and the other companies the same. A large booking agent in a city will represent probably half a dozen steamship companies, African, South American and Australian.

*By Mr. Wilson :*

Q. And he will favour those which are most useful to himself?

A. He will favour the one from which he will receive the larger bonus.

*By Mr. Clancy :*

Q. Is that not a reason why they should not be advised of the inquiries at the Canadian agencies so as to send them to some other country that suits them better?

A. Well, with our bonus we keep slightly ahead even of the commission they will receive from other countries. I have the figures here and will give them to the honourable gentleman. That was one of the purposes, as I understood it, for the payment of the bonus at all, and we cannot possibly get on in Great Britain unless we have the co-operation and sympathy of the booking agents even if the staff of the Government is made larger than it is.

*By Mr. Sproule :*

Q. Then how do you make out that you have it when on page 15 of your own report you say: 'Not only was there want of sympathy between the booking agents but in one noted case to which the attention of the Department has been drawn, an agent who was in receipt of comparatively large amounts of Canadian money under his own name, and very much greater in the name of another firm, was, in answer to enquiries, actually sending out letters to his officials warning intending emigrants against going to Canada'?

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A. The honourable gentleman will of course pardon me for telling him that I am discussing emigration from Great Britain and he is reading from a report regarding continental agents.

Q. I am speaking of booking agents.

A. Well, the portion of my report which the honourable member has read deals entirely with the work then in progress on the Continent, and does not refer to the work in Great Britain.

Q. Are they not the same as Great Britain?

A. Well, the principle of selling tickets is the same, but I am dealing in that part of my report with the booking agents on the continent.

Q. I am asking a question which entitles me to a direct answer: have you the same class of men employed as booking agents in Great Britain and on the continent?

A. A different class of men and working on different systems on the continent to Great Britain.

Q. Are there no booking agents in Great Britain?

A. Beg pardon?

Q. Are there no booking agents in Great Britain?

A. Certainly there are booking agents in Great Britain, but the class to which the hon. gentleman is referring is entirely foreign to the work of the booking agents in Great Britain. I was going on to say that in connection with the booking agents in Great Britain I have found a number of cases where I will not say they were unfriendly, that would not be fair, but where they were not taking an active interest in the Canadian work from no special reason, or for one reason or another.

Q. That is in Great Britain?

A. That is in Great Britain.

If the hon. gentlemen wish me to go on with the Continental business before I am through with this, of course I am entirely in their hands.

*By Mr. McMullen:*

Q. The booking agents in Great Britain are not the hired agents of Canada, are they?

A. Not at all.

*By Mr. Sproule:*

Q. They are getting a commission on every man the same as on the Continent?

A. I found, I may say here frankly, as I told the High Commissioner, I did not find that cordial feeling between the booking agents and shipping agents and the London office that I expected to find. I did not wish to say so here but I do not know why I should withhold it now.

*By Mr. Wilson:*

Q. Will you explain that further?

A. Quite a number of complaints were made of one kind and another, some, perhaps all of them, of a confidential character, and it was with a view to bringing about the utmost cordiality and co-operation between the booking agents, steamship lines, and all those interested in emigration work, that I made the recommendation in connection with the supplying to the steamship agents of this list, and so far we have found it, from what I am told in Glasgow and Edinburgh and London more especially, most satisfactory. They were all pleased with the change. They said they had desired these lists for a long time although they had taken no step to get them.

Q. I suppose you mean there was no attention paid at the High Commissioner's office to cultivate the good opinion of the booking agents?

A. I did not say that at all. I think there was a great deal of attention paid in the office to cultivate it, but it had not quite the result which I think the High Commissioner's office desired.



Q. You said you did not find the cordiality between the High Commissioner's office and the agents that you expected.

A. I didn't say the High Commissioner's office, I said the London office?

Q. You mean Mr. Jury's office?

A. No, the officials of the London office.

Q. The High Commissioner's office?

A. The office of the High Commissioner, but not the High Commissioner himself.

Q. I quite understand that because nobody that knows him would have any such feeling as that?

A. None at all. And it was with a view to bringing this about the change was made and judging from results, from what the Canadian Pacific Railway and the Allan and Dominion people say, there is more of a disposition to work together, and apparently they are not operating at cross purposes. That is what I had from the agents in a general way.

Q. That is to say there is a better feeling existing between all the steamship companies than heretofore?

A. And with the High Commissioner's office.

*By Mr. Sproule:*

Q. What do you mean here by saying 'there must be a policy of personal contact between the Government agent and the prospective emigrant—or in so far as possible a personal canvass with every probable emigrant, carried on with the same system, but perhaps not with the pertinacity which characterizes life insurance business in our own country. Yet under such circumstances and with the continuance of the system of a bonus to booking agents, too much must not be expected from Great Britain. It will require every possible effort to prevent a continual annual decrease in the returns from here, on account of the adverse circumstances already referred to.'

A. There is a division as to work in Great Britain which includes England, Ireland, Scotland and Wales. Then there is the term used as to Scandinavia which means Norway, Sweden, Finland and Denmark. Then there is the term continental work which includes the Continent outside of Scandinavia; and the term European has not a reference to the Great Britain work but rather to what is known as the Scandinavian section and the continental section of Europe.

Q. I thought you were not allowed to distribute literature in Scandinavia by the Government?

A. Oh, yes, we distribute a very large quantity of literature in Scandinavia.

Before leaving the London office, there was a question asked me a moment or two ago in relation to whether there was a Canadian in the London office. The agent particularly charged with replying to inquiries about Canada is Mr. Just, an obliging and careful officer who, I think, has been there some ten or twelve or fifteen years or longer, and I have found him exceedingly anxious at all times to answer inquiries to the full extent of his ability in relation to Canada. On that point I may say that Mr. Just told me he had not been in Canada for nine years. He had taken a hurried trip through Canada once and was desirous of coming to the country in order to see something of the changes in its conditions in ten years. In conversation with him I told him that I thought he should go. I could hardly come to the conclusion if I was away from Canada for eight or ten years, I would not be in a position to answer inquiries as carefully as I ought to in regard to the country although I might have been there all my life. I made a recommendation to the High Commissioner through the Department, last year, that he should be given an opportunity then of visiting Canada.

*By Mr. Burnett:*

Q. Did he come?

A. He did not come. The statement was made, in reply to my recommendation, that he could not be spared at that time from the office but possibly he

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might be spared at a later season. I may say to the Committee that this is one of the matters that I submitted to the Department, should not be delayed. I think that Mr. Just should have an opportunity, if he is going to answer all the questions in relation to Canada, of visiting this country. I have submitted to the Department that he is hardly in a position to say or to present the facts about Canada without a personal visit more frequently than once in ten or twelve years.

*By Mr. Macdonald (Huron) :*

Q. Was he originally a Canadian ?

A. No, an Englishman.

*By Mr. Burnett :*

Q. My question was : Was there any Canadian in the London office to give information on Canada ?

A. Mr. Reynolds is a Canadian. He was at Brandon I think, he was taken over there eleven years ago or more. But he is not charged with this branch of the work of the office.

*By Mr. Macdonald (Huron) :*

Q. Had Mr. Just any special knowledge of Canada when appointed ?

A. I do not know ; I do not think so.

Q. When was he appointed ?

A. I do not know, but I think he is entitled to a great deal of credit for the way he has endeavoured to study up, academically if you will, the resources and conditions of Canada.

*By Mr. Calvert :*

Q. Who makes the appointment ?

A. I suppose the Government from time to time.

Q. Would you make any changes in relation to his work ?

A. I would make the recommendation that he should be given an opportunity to make himself thoroughly conversant with the country and at no distant time. I did it as strongly as possible last year and with some diffidence, because I did not wish to go into the High Commissioner's office and say what should be done in relation to the duties of the permanent officials.

*By Mr. Macdonald (Huron) :*

Q. I think it should be done with a good deal of energy. It is no use having a man there—

No answer.

*By Mr. Gould :*

Q. It would not do to bring him out here when we are wearing our furs ?

A. Mr. Just knows something of the injustice done to Canada on the fur question.

*By Mr. Semple :*

Q. I think it would be better for some intelligent Canadian to go there ?

A. Mr. Just has been in the office a number of years, and I must say for him he is an exceedingly obliging, careful and conscientious officer. My relations with him have been more than pleasant.

Q. Have you found that the conditions in Great Britain for farm labourers or tenant farmers are so good that there is not much chance for them to come to this country.

A. In relation to the tenant farmers, as I say in my report, I think the proposal to secure them as emigrants might as well be abandoned first as last, more especially to open up new country.

*By Mr. Wilson :*

Q. Mr. Jury goes farther than that?

A. Yes.

Q. He says they are not the most desirable?

A. Of course that feature I am not going to discuss just now. I do not think there is any possibility of getting them, in the first place. The tenant farmer as we have understood here, at least, I had the idea before going to England, that he is possibly very much like our own farmers, but he is a country gentleman, he does not work himself, the members of his family do not follow agricultural pursuits in any respect whatever. The best in the land is not too good for the tenant farmer; he is simply a gentleman at ease, sub-letting the large possessions that have come into his hands to others who work out their living by the sweat of their brow. He has a delightfully easy time, and it is, I have no doubt, just as Mr. Jury says, if one such family possibly be persuaded to undertake the hardships incident to life in a new country they would very soon become so disgusted with it, that any report they might make of their own experience would have a deterrent effect upon their own class or every other class coming out from England. In that respect I think the expenditure of money with a view of securing immigration on that line is so much money thrown away.

#### ESTIMATED AGRICULTURAL POPULATION OF ENGLAND.

*By Mr. Wilson :*

Q. I see you favour those people who have to be helped.

A. Yes, the number of agricultural people that have to be drawn upon there is something less than a million out of the total population of England. That is all from whom we may possibly expect to make a draft with a view of getting them to settle in Canada. But just here, I may say that I think the time is coming when an effort can be made, and profitably made, from the older provinces, where there are cultivated farms upon which are good buildings, and all the necessary appurtenances, to induce a number of fairly well-to-do-people, I do not mean tenant farmers in that sense, to come to Canada.

*By Mr. Frost :*

Q. What do you mean by older provinces?

A. I mean Nova Scotia, New Brunswick, Ontario and Quebec. They might be persuaded to come to Canada where they would not for a moment entertain the idea of going to Manitoba or the North-west, and just here I may say, something is hinted at in that direction in Mr. O'Kelly's report. He has had under negotiation for some months the possible emigration of 300 or 400 families who are possessed of means averaging possibly £4,000 each; they might be persuaded, if they do not find the North West or Manitoba satisfactory, to select locations in some one of the older provinces and who, if they were brought in, would prove more than desirable immigrants, and whose attention has been directed to Canada. For some months, Mr. O'Kelly has been keeping in touch with them and their solicitors and he expects during the present year that matters will reach such a stage that some one or more of their representatives will be sent out to Canada, possibly he being asked to accompany them, with a view, if I may use the term, of spying out the land, and we may possibly look to see numbers of families from that locality settling in Canada.



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*By Mr. Wilson :*

Q. Judging from the reports of yourself and other agents, it is going to be difficult, inasmuch as times are so good in these countries, to get a desirable class to come out, unless you get those from among the poorer families.

A. That will hardly apply with regard to the families of whom I have just been speaking. They may be quite satisfied to settle in Manitoba or the North West. Their eyes are in that direction, but if they do not like it there, they may settle in the older provinces. There are probably 1,000 or 1,500 souls among them. Then as to the other classes which may be got in England, in the majority of counties in England and Scotland, now, the wages of farm laborers are high and there is a good deal to induce them to remain where they are. Yet there is a restlessness on the part of very many of the younger farm labourers and they drift into the cities. By going over the list with some care, as to this detail, with Mr. Jury, upon more than one occasion, we both have been forced to the conclusion that the greater number of those who come from England now with a view to settling in the North West, are being taken from the great centres of population. They had drifted from the farms and finding themselves unsuited one way or the other to enter into the conflict of life in the great centres of population, are desirous of drifting back to farm life, and a considerable number of them have come to Canada.

#### HOW THE GOVERNMENT OF QUEENSLAND PROCURE IMMIGRANTS.

I found last year by giving some attention to the work of the Queensland Government, and I think they spent about \$150,000 in free passages to that country, that the selection of the emigrants was carried out with a very great deal of care and system. I went, upon more than one occasion, down to the docks in London for the purpose of looking at those who were sailing on free passages, and I found them to be people just as I have described. They had drifted from farm life into city life and found themselves unsuited for it, so becoming dissatisfied and desiring to go back to agricultural life again, they had accepted the offer of the Queensland Government. This fact I found by personal enquiries among them, to be the case.

Q. Were these poor people with nothing, that would have to be assisted ?

A. Not altogether poor, but the Queensland Government would take them no matter how poor they were, if they thought that their qualifications with regard to moral character and mode of life was satisfactory. One of the absolute conditions, or the one absolute condition, was that they had been brought up in an agricultural life. That established, then they could establish their general character in regard to sobriety, industry, thrift, and so forth. They had to furnish the Queensland Government representative or agent with a testimonial from a local magistrate or clergyman, or such as one would naturally look to for a certificate of character under the circumstances. Under this, I think, 1,900 people went out at a cost of about \$150,000 to the Queensland Government.

Q. What would we do with a large number of such people without means ?

A. They, on their part, would have to make up their minds to have a severe experience before getting on their feet. They would have to have all the thrift and industry—

Q. Would have to be Scotchmen, in fact ?

A. I will give the Irish a chance too—they would have to have all the thrift and industry which is more characteristic in types of the European peasantry than the English; but I am still of opinion that it would pay Canada, as it would pay all the Colonies, if some means could be brought about whereby some sort of assisted passage and assistance could be rendered the people under such circumstances. I am sure a majority would succeed in the long run, the conditions being such as they could cope with.

. ENTICING FARM PUPILS TO COME TO CANADA SHOULD BE SUPPRESSED.

I may say in connection with the English work—and this is another phase of it that comes to my mind at the moment—that one has only to put an advertisement in an English paper asking for farm pupils in Canada, and there is a rush of young men anxious to go out to Canada—

Q. At what ages?

A. Well, on the steamship on which I came out there were, I should judge, about twenty or twenty-five coming out to learn farming, between the years of 19 to 24 or 25. They seemed quite ready from their conversation to plunge into any kind of hardship with a view of settling here. I was going on to say that any kind of advertisement like that would find plenty of young fellows or their friends who would pay for them—and in many cases they have unfortunately been defrauded out of their money.

Q. These are the better class?

A. Yes, for the purpose of learning how to farm, their object being of course to settle in the North West afterwards.

*By Mr. Featherston :*

Q. These are the sons of the better class of tenant farmers you spoke of?

A. No, I think sons of people in the city.

Q. Sons of people with means?

A. Yes, I think so.

*By Mr. Wilson :*

Q. I do not think many of these can be got?

A. Well, if you had a school of instruction in connection with an experimental farm, you could get any number of them to come out.

*By Mr. Featherston :*

Q. I do not think you would have any trouble, for I have noticed that a neighbour of mine has got nearly every year one or two, either a clergyman's son or a doctor's son, and the man he has as instructor knows nothing about farming.

A. The system of farm pupils is very bad and should only be carried on under Government supervision, if at all.

*By Mr. Douglas :*

Q. The Government should warn them against it.

A. We do all we can to warn them against it. I was in the Glasgow office only about a week before I sailed, and a young fellow came in who was going to pay a man £40 to teach him farming, his object being eventually to settle in the North West. We settled that case. In London a few days previously there was a case from East London of advertising for pupils, presumably to send out to Lucan, near London. The advertiser was going to make, comparing his charges with the steamship rates, about £27 out of each farm pupil. I do not know what can be done, but still I think something should be done by the Government of Canada to effectually put a stop to that in England.

*By Mr. Calvert :*

Q. How did you do in reference to foreign languages? Did you employ interpreters?

A. If we are through with the English branch, I will go into that.

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*By Mr. Clancy :*

Q. I would like to ask Mr. Preston, following that up, if any steps had been taken to warn the public in such cases as you have mentioned ?

A. Well, Mr. Colmer takes somewhat strong ground against the possible fear of litigation if one of the Government officers attempts to do that in any marked degree. I do not agree with him at all ; I would take the risk if I had the authority and take such steps as would effectually, even at a reasonable expense, keep farm pupils warned against such advertisements.

*By Mr. Featherston :*

Q. It should not be allowed without Government supervision ?

A. It should not.

*By Mr. Rogers :*

Q. Some of these do well, don't they ?

A. Oh yes, some of them do ; there were probably 40 or 50 on the steamer I was coming home on who had money of their own.

*By Mr. Semple :*

Q. Were any of them going to the agricultural colleges in this country ?

A. Well, there was one—I forget his name—who was coming out in the hope of getting into the Guelph Agricultural College. From my own remembrance of things there, I told him he would have some difficulty, as in my time the College was always full.

## THE LONDON OFFICE,—CHANGE OF LOCATION SUGGESTED.

*By Mr. Frost :*

Q. What do you think about the location of the London office ?

A. I would like to see the location of the London office changed. I do not know that I am debarred from expressing my opinion, I have expressed it in other quarters. The fact is that the *Toronto Globe* has better offices in location and fittings than the Government has. The American rendezvous in Cockspur Street is also more attractive than the Canadian office.

Q. Is there anyone there to give information ?

A. There are several to give information.

Q. When I was there I only saw a few boys.

A. There are several clerks there to give information.

*By Mr. Calvert :*

Q. Well, what arrangements are made for giving enquirers information ?

A. Well, I have been discussing that phase before the honourable gentleman came in. There are several officers there who are only too glad to meet Canadians coming in and to give them information.

## THE OFFICE IN DUBLIN,—DIFFICULTIES OPPOSED TO EMMIGRATION FROM IRELAND.

*By Mr. Wilson :*

Q. Before going any further I would like to call your attention to Mr. Devlin's report ; have you read it ?

A. Yes.



Q. It is at page 35 and it is very meagre and brief, and he does not seem to be doing anything.

A. I did not see Mr. Devlin's report till I read it here.

Q. I think Mr. Webster has given a good account of it: 'The Dublin office has been a most useful institution for people requiring information regarding Canada, and has also been largely availed of by Canadians visiting this country.' It just looks to me, from the report, as though Mr. Devlin simply stayed there and did what came.

A. One of the hon. members of the House in private conversation was speaking to me in the same line and asking the same question as Mr. Wilson is doing. I can say in all fairness that Mr. Devlin to my personal knowledge, I cannot say to the number of lectures, but certainly has lectured extensively. I have seen a number of advertisements of meetings where he was billed to attend, and a large number of press notices where he had delivered lectures, some of the notices being of quite an extended character. I have also personal knowledge of at least one of the large fairs that he was at, for I was there myself, and was also present on one occasion where he was delivering a lecture on Canada and knowing I was going there he wanted me to take the lecture, but I preferred to let him take it. I had an opportunity of hearing Mr. Devlin deliver his lecture on Canada, but the same question comes up there, as I referred to in connection with the English work a moment or two ago. I do not know but it is probably known to the members of the Committee and the House, that in Ireland it is almost impossible to get a large audience of the desirable class unless some very prominent man is chairman. The chairman there is much more important than here. You can have any kind of a lecturer if you have some kind of a figurehead, and the trouble sometimes is to get the figurehead as chairman. Mr. O'Kelly is strongly opposed to the lecturing system, thinking much more can be done in the quiet way in which he works, and I agreed with him on examination into the subject. In the southern part or centre of Ireland Mr. Devlin has been holding lectures and in the time I was there, and judging from reports in the press he had addressed a large number of meetings. But the difficulty is just this: All parties seem united in making this a *sine qua non*—they say, 'yes, we will preside at the meeting and help you upon one condition, that is that you don't advise people to go to Canada. You can talk all you like about Canada, show your views—but do not advise the people to go to Canada.'

Q. I think by the result they have carried out the agreement?

A. I do not know that it is necessary for them to do that. Given an opportunity of showing the pictures of Canada, given a good audience, and I must say that so far as the audience is concerned, I have heard of nowhere in Great Britain where the audiences are more representative or more largely attended, they are almost invariably attended by adults, than in Ireland.

*By Mr. Clancy:*

Q. Would it be desirable, under any circumstances, to hold a meeting with a chairman presiding under such conditions?

A. I am not prepared to say it would not be provided there is no other way of reaching the people. At least you get the view presented to the people that you cannot get in any other way. I do not suppose because I went to a meeting and told all I knew of Canada, and perhaps something I did not know, I should finish up with, 'now you should go to Canada,' I do not know that my advice would make one bit of difference. But Mr. Devlin has had undoubtedly an opportunity of disseminating information about Canada, to audiences of the adults class such as all the other agents combined, England, Scotland and Wales, have not had. That is the conclusion I have reached. You all know Mr. Devlin's powers as a speaker, and Mr. Webster also has a very pleasant way of speaking. There is a problem to be solved in relation to the work in Ireland that, under the present circumstances, I cannot see my way to suggest.

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Q. Mr. Devlin says : 'Coming to the business of our agency, I would say that statistics prove that we are securing a fairly large number of those who leave Ireland.' But the statistics say that there only came from Ireland 747 ?

No answer.

*By Mr. Wilson :*

Q. And of these only forty-seven actually settled on homesteads ?

A. I do not know how many settled on homesteads, that is not in my department, but certainly the Queensland Government pay a very much larger sum for only a little more than double the number, say three times the number in round figures. But to prove to the Committee, I think if they will pardon me for arguing the case, and I do not wish to argue it, I would rather confine myself to something else, but if the Committee will pardon me, I think they will find that of all the fields in Europe, Ireland is the most difficult. You have only to go to any kind of a meeting in Ireland you wish, more particularly in the south of Ireland, and if any proposition is made for emigration to Canada or anywhere else, some enthusiastic Irishman will get up and shout : 'Are you going to leave Ireland, until Ireland's wrongs are righted ?' And whether they leave or not, that generally breaks up the meeting. But taking the English Government returns, it is seen that 44,000 people left Ireland last year, and as careful an investigation as can be made, I think, justifies the conclusion that 90 per cent or almost perhaps more than that—and this is from enquiries of the booking agents—leave Ireland under what is known as prepaid tickets, friends, in America mostly, sending the money to pay their passage out.

Q. I am greatly in favour of that kind of immigration ?

A. I think if we can once get the stream running in our own direction and these people become fairly prosperous, with us in the North West Territory, it would operate there in the way it is already operating in other countries. When in Hamburg and Rotterdam a short time ago, I saw quite a large number of prepaid tickets and orders for prepaid tickets sent out to friends in other parts of Europe. It may be interesting to the Committee to hear that the Department of the Interior has received something like \$7,000 for the purpose of prepaying passages of Icelanders.

*By Mr. Frost :*

Q. Don't you think immigration in Ireland could be greatly enhanced if the immigration agent was changed from a layman to a clergyman ?

A. Well, I do not know.

Q. If two or three Roman Catholic clergymen could perform the duties of immigration agents in Ireland, men who have the privilege of speaking from the altar of a church and for whom the people have the greatest reverence and esteem, don't you think they would make the greatest progress with the people ?

A. I think it is not unlikely the influence of a clergyman of any denomination would have a very great effect, and I would be quite inclined to think so as to the southern part of Ireland, but my impression is that no local parish priest will allow his altar to be used for that purpose.

Q. Particularly in Ireland ?

A. I would be inclined to think so, in the southern part. I thought you meant in respect to sending clergymen out there.

Q. Send two or three Roman Catholic clergymen from here ?

A. I do not know about that ; that is a question one would have to enquire into, the hon. gentleman knows how easy a spirit of jealousy or resentment will arise, and between clergymen probably more so than among laymen, by a new man going into their district.

*By Mr. Sproule :*

Q. You were speaking of parties sending money home for friends to come out ? In what way was Mr. Devlin using money when he says : 'I advanced to deserving emigrants something like \$1,000 on my own responsibility' ?

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A. I remember that I understood from the correspondence in his office, I was quite convinced that a number probably of those were his friends who did send money for servant girls and assistants. I think that is the character of the work he refers to in the matter of paying passage.

Q. He was not handling Government funds?

A. Oh no, none whatever.

*By Mr. Wilson :*

Q. He said it was his own?

A. His own money, I think. I know that he advanced something like £200.

*By Mr. Calvert :*

Q. Did you say 90 per cent of the emigrants from Ireland came to the United States?

A. No, on prepaid passages—but a very large portion. I have not the figures of the exact number that went to the United States.

*By Mr. Monk :*

Q. How is Mr. Devlin able to state that 747 immigrants came to Canada as a result of his labour? Is there a check kept of the number, or how does he know?

A. Mr. Murray, Mr. Devlin and Mr. O'Kelly have kept a record of those with whom they come in contact and those who come out to the country under their representation, and they contend that our records do not cover all that come.

*By Mr. Wilson :*

Q. They do not give the number they have sent out?

A. I think you will find in Mr. Murray's report something of the kind.

Q. Mr. Devlin says: "The way in which the statistics are kept cannot convey the idea of the number of settlers going to Canada."

A. Yes, Mr. Devlin has his own views on that question. He is dissatisfied with the way in which the records are kept not only in England but in Canada. He thinks that justice is hardly given him by the figures.

*By Mr. Calvert :*

Q. Do the United States give any assistance to immigrants?

A. None whatever.

*By Mr. Wilson :*

Q. Do they not pay the ticket agents anything?

A. I think not.

*By Mr. Monk :*

Q. Do you not think we should have some way of checking the arrival of immigrants here?

A. Yes. The arrival of immigrants is checked here and, I think, very carefully, judging from what I saw at Halifax, and what I noticed at Montreal and other ports.

Q. Is it your opinion that immigrants should be followed, after they land in this country, to see how they get along, and that they do not go to other countries?

A. I think it will hardly pay for the trouble involved.

Q. That is what they do in the province of Quebec. We follow them from England, and after they arrive we follow them, and after a while if they require assistance or advice our agent visits them and they become immigration agents themselves to their own people.



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A. But in that case do they not largely go to one locality?

Q. Most of those who come from England go mostly to the townships, but our immigration agents follow them up sometimes for two years after they reach here, and assist them by advice.

A. The area to be covered in Quebec is somewhat limited in contrast to the vast area that has to be covered in the North West.

*By Mr. Wilson :*

Q. Mr. Murray speaks of those leaving Scotland, I think, and gives the number at 1,803.

A. Oh, certainly, I did not intend to convey the impression that it relates to Ireland.

Q. I have not found that in Ireland a record is kept?

A. Mr. Devlin contends that many of those who come from Ireland are not recorded in the departmental records. He says that the way in which the statistics are kept cannot convey an idea of the number of settlers going to Canada as no record is kept of those who travel saloon and second-class, and that it is noteworthy that many of these young settlers prefer travelling first class. The records of the immigration department, I fancy, only deal with what may be known as steerage passengers.

*By Mr. Calvert :*

Q. Have you given the cost of immigrant transportation from Europe?

A. No.

Q. Perhaps it will be of interest to give it to the Committee?

A. Yes, I will give it.

In relation to the work in Europe, on the Continent, if the Committee will allow me to take up that branch of the subject now.

## PREVALENCE OF IGNORANCE IN ENGLAND, IN REGARD TO CANADA.

*By Mr. Rogers :*

Q. You spoke about the ignorance in England on matters relating to Canada. What do you think could be done to dispel it? A friend of mine who has been out in this country ten or eleven years, and who went back recently, told me, in talking about the ignorance that prevails there respecting Canada, that the mayor of the town in which he was visiting, for example, did not know where such a place as Canada was, if he was shown a map of North America he could not find it.

A. On that subject the members of the Committee have only to take hold of any London newspaper and read the comments on Canada and on the Canadian contingents that have gone to South Africa, to be convinced of the terrible ignorance on the part of what may be called moulders of public opinion, respecting Canada. I see in the *Standard* a despatch respecting the Canadian contingent, in which they are referred to as a very desirable class of men, which was accounted for because they had lived on the open prairie and in the mountain fastnesses. Reading the London papers day after day would make any Canadian very tired in relation to the popular opinion about Canada that is entertained there.

*By Mr. Featherston :*

Q. There is one thing they have to admit, and that is, that they are a good deal better soldiers than the English.

A. Upon that there can be no question, and any one looking at the ranks from which the English soldiers are chosen and comparing them with the bright and intelligent faces of the Canadians, he will see that the men in the ranks from Canada, are taken from the same classes from which the officers come in England. A short

time ago the London agent of the *Toronto Globe* told me about his experiences with one of the members of one of the largest houses in England, engaged in dealing or manufacturing perfumed soaps and perfumery. He went down to this house to see if he could not get an advertisement for Canada and after expatiating on the benefits to be derived from an investment in the proposed advertisement the manager turned around and said very seriously, 'You have made out a strong case, but do you think the Canadian people really need our toilet soap and perfumery.' That is a fair sample of opinion there, it is not overdrawn, of English ignorance about Canada.

*By Mr. Wilson :*

Q. They evidently do not judge by the specimens we send there ?

A. Well, they will ask you, as I have been asked on Regent Street, 'what will you do with the clothes you have on when you get back to Canada?'

*By Mr. Featherston :*

Q. These people could never have eaten Canadian cheese ?

A. It is mostly called American cheese, and the people of Canada will be abundantly justified in going to considerable expense in having an office in London that would be more calculated to display the advantages of Canada than that we have now. That is my opinion.

Q. A better office than the present one ?

A. The people of Canada would be abundantly justified in going to the expense of having an office in London, where they could make a better display of Canada and its resources than now.

*By Mr. Monk :*

Q. Can you suggest anything on the point raised by Mr. Rogers' question, to dispel that ignorance of Canada in England? I was asked myself if I ever went out bear hunting, how it was done, about my life with Indians; is there not some way by which that first crust of ignorance could be broken ?

A. Well, it will cost the people some money. I think one of the best ways is to open up an office in a good location instead of having the Government offices in a dark, dingy, smoke-begrimed, dirty building where you can hardly see anything.

*By Mr. Wilson :*

Q. It is only a rented office ?

A. Yes.

Q. You can change it then ?

A. I think the people of Canada could pay twice as much rent for better offices. My conversation with the High Commissioner leads me to think he would like to see the location of his office changed.

#### PROPOSAL TO EDUCATE THE MASSES OF ENGLAND, IN REFERENCE TO CANADA.

*By Mr. Guillet :*

Q. I would like to point out what I think would be a good method of conveying to the people of England a good idea of this country, and that way is this: It has been proven that our best immigration agents are those in the country who send for their friends. Now, cannot that be enlarged? I do not see why an appeal cannot be addressed to the farmers' institutes and by addresses to the people at fairs, to appeal to them, to point out to their friends at home the advantages of coming to this country. I am sure there are many people who would do so if they thought the Government would assist them to place literature in the hands of their friends,

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and assist them to come out where they need it. I would like to know what Mr. Preston thinks of something of that kind.

A. I was going to say in reply to the hon. gentleman, that the Department has now in progress, as the outcome of Mr. Smart's visit to the old country, the preparation of what might be termed a school book, written in a narrative form and giving in a pleasant kind of way a fairly intimate and quite accurate knowledge of the resources of the country, and so written that it will be interesting for school children to read. The intention is to place this in as many schools in England as access can be had to, and to offer rewards for familiarity with the information contained therein.

Q. My idea is to get the people here who can be trusted by their friends to write to them.

A. That is a case where it would be everybody's business and it would degenerate down to nobody's business. They might or might not do it. But I have recommended that the lecture business shall be modified somewhat and more of quite conversational work be done in circles where information has not hitherto travelled. At present we can get more immediate returns that way, and in future if the school children can be educated up to a knowledge of Canada we may expect more. If you go to England you soon see that Canada is but a small speck on the great horizon of the world, the interests which centre in England.

Mr. Wilson asked me as to doing something with the large class having no means which I have referred to in my report. One has only to go into the great centres of England to find—and the work of the Salvation army bears out the idea—that there are thousands of people, and the number is growing every year, who have absolutely nothing to do, who are living in England because England has been made a cheap place to live in, and having no means to get out of it they simply live on, and I judge each generation will be worse than the preceding one. From a philanthropic view one would say that something should be done for them, and from a business point of view something could be done for them to the benefit of Canada and the other colonies. To give you an idea of what may be done: I visited Mr. Quarrier's institute at Bridge of Weir, a few miles out from Glasgow—you have probably heard of the place—where from a small beginning there has grown up an enormous institution into which, under this great philanthropist, thousands have been gathered up from the slums of Glasgow. Here are children who, until brought to his homes, never knew what it was to have a bath, never knew what it was to sleep in a bed. I had an opportunity of investigating this enterprise a little while ago, and asked the heads of the institution how they found character developed and environment affect the morals of people born under such circumstances. The record they give there is astounding, one would hardly believe that the young boys and girls brought from the homes I have described and cared for there could be so completely changed in life and character.

*By Mr. Wilson:*

Q. That is not the class of people we want brought out that you refer to in your report?

A. That is a class of people a little better—I am speaking now of the dregs—the class I refer to in my report are a long way from that.

Q. The class you have been speaking of is an idle class spending their lives in idleness?

A. That is the class I have been speaking of, but the class I refer to in my report—

Q. Just before you spoke of those going into the institution you spoke of a large class having nothing to do and from generation to generation degenerating; I understand that is the class we would have to assist?

A. No, I was going on to say that that class is receiving a large accession every year from a better class of people who are drifting under the poor laws. The fact is evident in London to-day, where the poor rate is 14s. 6d., almost \$4 per capita. Enor-



mous sums of money are being spent, and this has increased in the last ten years, as I judge from what I have heard, by the accession to this lower class of a better class, drifting into the city and not finding employment, gradually getting down to the level of this class which has been degenerating for generations. They may show some latent ambition which might be stirred in a new country. If some scheme could be brought about by which they should be brought to the Colonies, they should become reputable citizens. That class I would like to see something done with.

*By Mr. Monk :*

Q. How can you reach that class ?

A. That is a difficult question. I think they could be reached if some scheme could be inaugurated by the various Colonies and with the assistance of the Imperial authorities, and with assistance they might make money.

*By Mr. Wilson :*

Q. Would you not find great difficulty in doing this ? A man who is an agent in dealing with these people would have to be of great experience or he would be imposed on by the other class of people.

A. My experience in connection with the question of difficulty is that you cannot do anything without great difficulty. I quite appreciate there would be a very great deal of difficulty. The Queensland Government is solving that perhaps with a higher class. But as I said before the question is one of policy.

*By Mr. Hurley :*

Q. Could they not be reached by the same system as the Barnardo boys ?

A. I think by a better system.

MR. HURLEY.—I have seen a good deal of that system for the last fifteen years, and I think it is improving every year. I know now the class of boys sent out are far ahead of the class sent out some years ago. The last day before I came down, three boys came from Belleville to Smith's Falls—they got off at different stations—and three more intelligent boys I never saw. They were nicely dressed and fit to go into any man's house. Why not reach them through this system ?

*By Mr. Wilson :*

Q. Is Mr. Preston now discussing the poor class ?

A. Yes. I was speaking a few minutes ago, about Mr. Quarrier. His records show they have not any record of any single one of the inmates of his institution either male or female, who had come to Canada and going to the bad.

Q. Who said that ?

A. Mr. Quarrier.

*By Mr. Sproule :*

Q. We were talking a while ago of reaching them by means of literature and your enquiries of how the literature was distributed or not distributed. I understood you to say that you found more on continental Europe that was not distributed than in Great Britain.

A. I was dealing in my report with the European phase but the special incident mentioned in my report is that upon the sale recently of one booking office to another in England the case was revealed where there was practically a cellar full of Canadian literature which had been allowed to accumulate for a great many years.

Q. Where did you find this ? I understood you to say it was in continental Europe, not in Great Britain.

A. No, if the hon. gentleman will pardon me, we were dealing entirely with Europe outside of Great Britain ?

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Q. Did you find that in Great Britain as well?

A. I am trying to make myself understood that I was dealing with conditions on the Continent, but that in one office in England we found the same conditions existing, as to distribution.

Q. That is what I am trying to reach?

A. The hon. gentleman read one section and asked me an explanation. The section had reference to continental work.

Q. I followed that up by asking if you found the same conditions in Great Britain.

A. I did not, but I found the same in the one particular instance which I referred to in my report.

Q. It will be the same thing?

A. In one respect but not taking the thing as a whole.

Q. I understood you went there to find how the work was being done through the office. One way was through the distribution of literature and in this report you say it was not done. I read that reference to it in your report and asked you if that was the general experience. I understood you to say that was only taking the continental work. I followed that up by reading the report of what you found in Great Britain.

A. The same conditions did not prevail in England except in relation to this one place, the reference to which I make in the report, while I found that more general in Europe, as my report indicates.

Q. I presume the discovery was only in some accidental way?

A. Quite so.

Q. Might this be taken as a fair illustration of the way it is done in Great Britain?

A. I hardly think so.

*By Mr. Douglas:*

Q. Is there not a growing want of confidence in the literature as to the representation of things in the North West?

A. I have never met that, exactly.

Q. Never met with it?

A. I will not say that I have met with satisfaction.

Q. I have heard statements of this kind that people who have gone to the North West and gone home have in public meetings said they were betrayed and victimized by the pamphlets of the Government.

A. I have no recollection of hearing that.

Q. I know it has taken place. A clergyman of my district tried to do some work of this kind and found himself utterly hindered by the testimony of parties in the meeting, who had been there.

A. I think there cannot be too much care exercised in describing the resources of the country. In fact I would rather see them understated than overstated.

Q. In the pamphlet referred to there was a picture of a lake that I know very well. It was represented as a beautiful lake with a steamer on it and Englishmen shooting ducks all around it. People know better and get hold of these pictures. I would like to say this on behalf of the West, because it seems you have a very great deal of difficulty in getting people into it and there must be something wrong with the country or with the system of immigration.

*An hon. Member:*

Q. Or with the representatives?

Mr. DOUGLAS.—The representatives are all right, the people are all right and the country is all right, but I believe that in our present immigration policy—because I am not referring to one Government or another, the one Government is carrying out and extending the system of the other—that, as an American would say, I believe we are whittling on the wrong end of the stick, that the whole system is wrong and that

what we want to do is to give our people in the West the conditions of success, and spend less money in immigration policy and work abroad. If we can convince the world that farming is a success in the North West we do not need so many foreign agents. It required no foreign agent to bring the people into the Yukon because the people of the world believed that there was gold there, but we have more gold in the prairies of the North West to-day than you have in the Yukon if people only believed it, and I say that we should let our own people be our immigration agencies and let their letters home talk for the country and we will not need to take the people's money and resort to all sorts of devices to persuade the people of the Old Country to come over to Canada. They will come over of their own accord, and that speedily, if we show them that farming is a success. But when you plant a lot of people down under colonization companies under conditions that it is impossible for them to make a success, and these people are continually writing home in that strain, they are doing a vast injury to Canada in the Old Country. And I will say more, I believe in all honesty that letters that have gone from the northern part of my constituency to the Old Country will do more injury to the country than all the immigration agents you have employed can overcome.

#### BOOKING AGENTS, THEIR PERSONAL INTERESTS AND INFLUENCE.

*By Mr. Clancy :*

Q. I would like to ask what remedy you have found for the case that you pointed to in your report, of literature having laid for a very long time and accumulated without being distributed, whether you have found any solution for that, and if so, what solution is to overcome that difficulty?

A. You are speaking in relation to England, I suppose?

Q. Yes.

A. This case to which I refer was one that was brought to my knowledge by Mr. Jury; but I have been visiting various booking agents in a number of cities and towns in England, making a sort of hurried visit of course, and I found that they are quite willing to be pressed almost to a degree of unseemly inquisitiveness on my part as to what they are doing with the literature. And I think if inquiries of that kind were occasionally made in large districts from which emigrants are being had, we will largely solve that difficulty, and by accepting at the same time suggestions from them as to the character of literature, the way in which it should be got up, and the information that might be placed at their disposal. There was one booking agent who complained to me very much just along that line as to the unsuitability of the literature supplied. He had a poster which he had received some little time before, and I do not doubt the members of the Committee who take an interest in immigration affairs for some years, must remember it very well, I think it was afterwards recalled, but it was a large poster in which it almost created the impression that gold and silver and precious stones were to be found almost for the picking up in Canada.

Q. Where did that come from?

A. From Ottawa.

Q. From the department?

A. From the department.

Q. About when?

A. About ten or twelve years ago, I think.

Q. Did he show you the poster?

A. He showed me the poster—I destroyed it then and there.

Q. Had he been using that poster?

A. I do not think he had, I think he looked upon it rather as a joke more than anything else,—perhaps he was joking and wanted to give me a roasting.

Q. What is the remedy?



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A. I think if some means of keeping in touch with the agents by somebody representing the Government, asking for suggestions, and taking notice of them and seeing that literature is not sent to them that is not proper to be circulated.

Q. Having made that statement I would like to call your attention to a paragraph in your report on page 15, and before doing that I want to say a word to lead up to it. A few moments ago you made the statement that the booking agents were seeking to make the most money they could, but that they were agents not only for Canada but for other countries, and that when they could book emigrants more readily for any other country than they could for Canada, they would do so, would it not be a mistake to place in their hands the information that these people are making enquiries; I will not argue the case; but it seems to me rather to discount the chances of Canada when I read this paragraph: 'But work in emigration localities entailed an expenditure of time and money, and certain booking agents apparently learned that it necessitated less expense to try to secure the privilege of booking emigrants at the port of embarkation and thus secure the bonus, than to work the fields from whence the emigrants hailed. Thus it was that the competition for the bonus became more active than the work to secure a movement in favour of Canada at the homes of the prospective emigrants, and the means that were resorted to by some of the runners for booking agents to divert intending emigrants from one office to another, were such as booking houses having the largest internal connections in Europe declined to countenance.' It would seem to place this information in the hands of booking agents is to put it, from that report, in the most dangerous quarter it could be. It seems to me that if any class were to be avoided to secure emigrants to Canada it is the booking agents, as they are the agents of everybody they can make money out of. The steamships are anxious to get them, and they do not care where they go, and I think it has been a very great mistake in the past and, so far, there does not seem to be any better state of things, and I would like Mr. Preston to state to the Committee how he works that out in view of that statement?

A. The hon. gentleman is making the same mistake, if he will pardon me saying so, as another hon. gentleman did a few moments ago, he has read from my report a paragraph on the continental work.

Q. This statement is general?

A. I beg the hon. gentleman's pardon, it is especially as to Continental work. Entirely so, as separate and distinct from the English work. The statement referred to in my report, I submit, deals altogether with European work and similar conditions are not evident in the work in Great Britain. If he will do me the honour of reading my report, he will arrive at the same conclusions that I reached.

*By Mr. Guillet :*

Q. Can not some means be adopted by which to obtain letters from successful emigrants in this country who have done well, that would represent to the friends at home the advantages of this country, that could be put into the hands of our agents at home, and they could present these letters at meetings which are held in that country?

A. The point raised by the hon. gentleman is exceedingly well taken, and I am very glad to hear him advance it, and the Department has been endeavouring to do that for a long while, to get letters from successful settlers in this country and to have them transmitted to England and the Continent, but the system by which they are collected is hardly thorough enough and I would like to see it done very much more fully than it is.

Q. It could be certified letters?

A. It should be done in such a way that they would be of very great assistance, and I am hoping, before I leave, that the Department will feel justified in accepting these suggestions. I know it is simply carrying out the policy that the Department has been endeavouring to carry out for some time with the present

officials. Mr. Pedley is here and could, I think, give the Committee some information upon that point that is not at my disposal.

Q. I want to say, Mr. Chairman, that when I made enquiries from Mr. Pedley as to the efforts of the Government in bringing out agricultural labourers I was told that nothing was being done, that is as far as Ontario is concerned, and that no representations had been made to the Government that agricultural labourers were needed in Ontario. The fact remains that they are scarce, especially as so many thousands are now taken to the North West for the harvest, of whom so many remain there and no doubt build up the country.

A. I have tried—and I might say just here in amplification of it—to impress not only on the Government agents but the booking agents, that Manitoba and the North-west was not all of Canada, that we had other provinces, and that they would find abundant field for their energies and ambition in many of the older provinces.

*By Mr. Monk :*

Q. You did not get any letters from the North West members to that effect ?

A. No, I did not, no.

Mr. GUILLET.—I asked the farmers who mentioned it to me, one or two of them, why they had not made representations. I asked them why they did not pass resolutions in their farmers' institutes or agricultural societies to have petitions got up and presented to the Government in regard to the scarcity of farm labourers, and they told me it was not a proper resolution for such societies, and that when they presented such resolutions the chairman and officers of the societies declared it was not proper to bring them up. That is why they came to me to make their views known. Of course they could have got a petition circulated, but that is hardly a thing they would think of.

*By Mr. Clancy :*

Q. I want to be clear about this point, is it customary to pay bonuses to the booking agents in the United Kingdom ?

A. Oh, yes.

Q. You say this report, the portion to which I have reference, entirely deals with the continental emigrants ?

A. I am not just sure which part you refer to.

Q. Page 15.

A. Well, there is a paragraph there, the hon. gentleman will see, dealing with England, but the part which he read, deals, I think, entirely with continental business.

Q. Do you find any difference between the booking agents to whom that paragraph seems to refer, and the booking agents in England ?

A. I do not know that I catch the hon. gentleman's meaning.

Q. You point out that they were not agents alone for Canada, but agents for those who will pay them best ?

A. I do not think I pointed that out, but they are agents for several lines and that it is human nature that their interests would be with the line paying them best.

Q. That is so, we are all human ; does that obtain in England, having reference to the emigrants leaving England, Ireland and Scotland, as it does from the Continent ?

A. I should judge the English booking agent has as much of the old Adam in him as the others.

Q. And just as liable to go wrong as the others ?

A. Yes.

Q. Then what is the object of saying this had reference to emigrants from the Continent when I referred to it, seeing the same thing applies in the both cases ?

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A. The paragraph the hon. gentleman was reading applied to continental work; I did not say the same had been done in England. What I said, and what I say now, is that when I wrote that paragraph I was dealing with the continental work.

Q. And now you say it applies with equal aptitude——

A. No, I do not say so. What I was writing about was the continental or European work.

Q. Well, I am enquiring about the general work, whether the work in England, Ireland and Scotland and Wales would be affected in the same way?

A. Well, in the work in England, Scotland and Ireland the conditions and the whole propaganda is on a different basis from that and I can hardly reply to a suppositious case, the conditions not being the same.

Q. I am talking of booking agents alone, following your statement that the moment an enquiry is made at our own office, that steps were taken at once to inform the booking agents of the names and locations of the persons making application?

A. The statement I made was that once a week there was to be sent out from the Government office, a schedule showing the names and addresses of those who had been making enquiries.

*By Mr. Sproule :*

Q. Sent to whom?

A. Sent to the Allan line, the Elder-Dempster line, the Dominion Steamship Company, and the Canadian Pacific.

Q. For what purpose?

A. So that they in their turn can place themselves in communication with a view to securing if possible these enquirers as Canadian emigrants.

Q. Through whom, if not through the booking agents?

A. Through the booking agents or however they can be got.

*By Mr. Clancy :*

Q. To enable them to get the bonus?

A. To get the emigrants. I take it the Government cannot first offer a bonus and then try to prevent the booking agents getting it. If we want anything, we want the active and energetic co-operation of the booking agents. We cannot afford to be unfair to them or wanting in candour. We say to them 'you shall get so much for each emigrant, the conditions being that they shall be agriculturists and that they shall go to the North West Territories and Manitoba.'

Q. Who is to be the judge of that?

A. The Department is to be the judge of that.

Q. No, I am dealing with the booking agent.

A. If the booking agents send some one out here who is to go into one of the other provinces they cannot get the bonus. If he is going to send a labourer or a mechanic or any one in another calling than agriculture he cannot get the bonus and he knows it. We cannot afford to have the policy of paying the bonus and then have a Government agent running around and saying 'don't go to that agent or it will cost us 7 or 8 shillings.'

Q. That is not what I mean but perhaps I did not make myself clear. I asked at one point if steamship agents got a bonus on all and I was told 'no,' that there was a class that came from our agents in Great Britain?

A. I think the hon. gentleman has a misapprehension as to the fact.

Q. Well, you will find that is the statement that is down.

A. I bow to the hon. gentleman. I have tried to make myself clear. In the first place the individual agents are not paying anybody.

Q. But they can get them by being booked by the agents as receiving the bonus, I presume?

A. They would have some difficulty in it.



*By Mr. Wilson :*

Q. I suppose the second class cannot get them ?

A. The second and first class passengers cannot, but in the other case it would be rather a rare thing were some booking agent would do it.

Q. Because they look so closely after it ?

A. Of course they look closely after it and in order to get the rates over the Canadian Pacific railway from Halifax to Winnipeg they would have to issue a certificate, if they didn't sell a ticket on that side and he wanted to buy on this side they would have to forward a certificate by him to the Canadian Pacific Railway, that he was a bonused passenger and entitled to the £2 10s. rate. The Canadian Pacific Railway will very properly not allow the ordinary traveller, be he tourist or gentleman, to secure the £2 10s. or the \$12 rate. They issue tickets to immigrants from Halifax to Winnipeg. As I understand from the Canadian Pacific Railway, only those who produce a certificate from the booking agent that they are immigrants are entitled to the £2 10s. rate.

*Mr. Featherston :*

Q. That is the check upon which you pay the bonus ?

A. That is one of the checks.

*By Mr. Monk :*

Q. Is the bonus paid on the certificate from the booking agent that he is an immigrant ?

A. No, that was done in the West.

Q. How is it proven ?

A. That is only one of the links in the chain. They follow him up here on his arrival and, I think, as far as Winnipeg. I understand that he has to be checked at Winnipeg as an arrival, declaring himself to be an agricultural settler and upon that the bonus is paid. You see as I understand it, that is one of the things wherein I found the English booking agents dissatisfied and were out of sympathy with the Canadian work or had been at least. They unjustly accused the London office of withholding the bonus which they had earned and which the Department here for years declined to pay unless they had assurance not only that the ty had reached here but almost settled on his land, and under these circumstances they said 'if we have to wait a year before we can get our money we will not try to earn it.' We want at least to see a check in sight.

*By Mr. Featherston :*

Q. They wanted spot cash ?

A. Not exactly that, but some possibility of getting the money within a reasonable period.

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
WEDNESDAY, May 16, 1900.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock, a.m. ; Mr. McMillan, Chairman, presiding.

Mr. W. T. R. Preston, Inspector of European Immigration Agencies, was present by the request of the Committee, and was examined as follows :

Mr. Chairman and gentlemen of the Committee,—Before referring to the matter that I intend more particularly to deal with I wish, to contradict the statements

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made in the *Citizen* newspaper that at the last meeting of the Committee I expressed my regret at not finding one Canadian in the High Commissioner's office. I am sure, Mr. Chairman, I am within recollection of the honourable Members present when I say that no such opinion was expressed by me.

*By Mr. Wilson :*

Q. Before you commence your new subject I would like to have you explain one point; you have said here you thought there should be a change in the Old Country work and that it should be done by seeing people and not by lecturing; would you outline what you mean by that?

A. The idea as expressed, though not worked out in detail, in my report, is that I think there has been too much time spent in lecturing and in lantern-slide exhibitions, and that there ought to be a system inaugurated by which, as I say there, the Government agent could be placed more in personal contact with intending emigrants. That has been adopted of late by all the agents and they have found it work satisfactorily. It will take some time to work out a settled plan on that line.

Q. You mean that the men in charge of the agencies will do this and not stay in the offices?

A. Certainly.

Q. That they would go out and talk?

A. Go out and visit intending emigrants.

Q. That would make it a cheaper business?

A. Well, it would all depend on the extent of ground covered. I may say, while on that, that I think—and this view I have not discussed in England—that with something of this kind an arrangement could be made by which Mr. Jury and Mr. Mitchell might be separated, one going to Birmingham and the other remaining in the Liverpool office.

Q. The amount for the Government offices is very large; for instance the Dublin office, as you know, costs us \$6,859, the Dumfries office \$1,887, the Glasgow office \$4,76, and so on, till in Great Britain and Ireland I think it is a little over \$32,000 besides incidentals.

A. I have not made up the amount. Still I will say for Dublin, that Mr. Devlin and Mr. Webster are not wasting their time by sitting in the office. I have been over there three times; they have a hard field and not much return has been immediately possible.

## THE PERSONNEL OF THE LONDON OFFICE.

*By Mr. Clancy :*

Q. Will you tell the Committee what arrangements are made in the London office for giving information regarding Canada?

A. Mr. Just is the one specially charged with that work in the London office—I had a desk in the same room with him—and I should judge he had been doing that for several years. He has a number of pamphlets prepared for use in response to letters or personal inquiries.

Q. Is Mr. Just a Canadian?

A. No, he is an Englishman, I understand.

Q. Does he give this information from what he has read, or from a very thorough personal acquaintance with the affairs of Canada?

A. From what he has read as I understand it; he has only been in Canada once, nine or ten years ago.

Q. Do you think under these circumstances he is well equipped?

A. Well, I took the liberty of suggesting in my first report to the High Commissioner that I thought Mr. Just should be given an opportunity of visiting Canada

in order to make himself more thoroughly acquainted, from personal observation, with the resources of the country.

Q. You thought it would increase his usefulness in that position?

A. I did.

Q. You said something a moment ago about Canadians in the office at London; how many are there?

A. I do not know that there is one who was born in Canada. Mr. Colmer, the Chief Secretary, was taken from Canada when the High Commissioner's office was opened, and he has been there ever since. I think he has been out to Canada several times. Then Mr. Reynolds formerly lived in Brandon; I believe he lived in England, but became known as an adopted Canadian, and for that reason was taken into the office.

Q. So the press was not far wrong in saying there were no Canadians in the office?

A. Oh, I am not complaining of the press publishing that statement, except in respect to the allegation as coming from me.

Q. Then it was substantially correct?

A. No, not correct at all as coming from me.

Q. Correct as to there being no Canadians to give information, but not correct as coming from you?

A. Oh, I should say so, that is a better way to put it.

Q. Do you think it would be an advantage to us to have some Canadian thoroughly conversant with our affairs in that position?

A. I think so.

Q. Have you ever made a suggestion of that kind, Mr. Preston?

A. Not officially, only in an informal way.

Q. Informally, but you never made an official suggestion?

A. Not officially. It is a subject of negotiation now, I am bringing it before the Department. I can say that without violating secrecy.

Q. Has that suggestion been well received?

A. It has.

Q. You make your headquarters in London?

A. In London.

Q. Are you there the greater part of the time?

A. I have not been. Of the year and fifteen months I have been away I fancy I have been in London four or five months altogether.

Q. While in London what do you do?

A. I have particularly to make enquiries into the correspondence that is taking place, and try to keep myself in touch with what you might call the officialism, red tape, or correspondence in the office.

Q. I suppose as inspector of agencies you consider it part of your duty to see how that office is carried on, to see if there is anything that might be well changed?

A. I am not charged with the duties of inspection over the High Commissioner's office.

Q. But there is part of the work over which you have control in England connected with the High Commissioner's office?

A. Yes, as to inspection.

Q. Well, I will not put leading questions—from your observation do you think matters are conducted there on the best methods?

A. I do not know that I can grasp your full meaning?

Q. Well, I may go back first to your saying there is no Canadian there.

A. That I think you may take for granted, unless one of the gentlemen mentioned was born in Canada.

Q. The main object of that is—I mean a Canadian having lived in the atmosphere of our country must know more of the ways and habits of our country than can be learned by hearsay?

A. Yes.



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## IMMIGRATION OFFICES AND AGENTS IN GREAT BRITAIN, IRELAND AND THE CONTINENT.

Q. But would you suggest any improvement from your own observation, I do not mean in the work of the High Commissioner himself, but in the work of the office conducted there, that would not always be under the eye of the High Commissioner?

A. Yes, if the Department asks me for suggestions I will make them.

Q. Do you think any useful changes can be made?

A. Well, I have made the suggestion there, and I think I can make it here without being misunderstood; that I think there should be an interchange of officers. I made it one of the conditions when I went over there, that I should not be allowed to remain there and get rusty on Canadian affairs—I should be allowed to come home once a year. I think with profit to Canada there might be an interchange of officers, some coming here and some going over from here, and thus keeping the office alive with an actual Canadian sentiment.

Q. Would you state what you think to be some of the defects in a general way in the office there?

A. I would hardly feel at liberty, Mr. Clancy, to go into that question; it would not be proper on my part.

Q. Who is looked on as chief office man?

A. Mr. Colmer.

Q. Mr. Colmer is the chief office man?

A. Yes.

Q. You say he was taken originally from Montreal?

A. From Montreal, yes, I believe so.

Q. Is he a gentleman you think well up in his work?

A. I think he is one of the cleverest officers in the Dominion service, one of the cleverest men I ever met.

Q. And as a result you say he is well up in his work?

A. Anyone will be convinced of that by careful examination of his work and the official records.

Q. What are his duties?

A. His duties take a very wide range; I am not acquainted with all of them. In fact everything connected with the High Commissioner's office is referred in the first place to Mr. Colmer.

Q. Have you found at any time in the working out of your duties as Inspector, that they conflict in any sense with the work in the High Commissioner's office?

A. Not with the High Commissioner.

Q. No, I mean with the office?

A. I do not think I was wanted there by the other officials; in fact I have no hesitation in saying that I think it was rather looked on in some circles that I was a kind of interloper. I said so there and I say so here.

Q. Well, having lived in Canada, where there is no red tape, did you notice much red tape there?

A. I thought there was too much in immigration work there to suit me; I split on that rock very soon.

Q. Well, now, have you ever made, you say you have never made any official recommendation regarding these matters?

A. Yes, I have made a good many recommendations covering the immigration work generally.

Q. The matter is now under discussion?

A. Yes.

Q. You have made official recommendations, have you?

A. I have made official recommendations in regard to some questions wherein we did not see eye to eye; that is, Mr. Colmer and myself. We did not see eye to eye with regard to immigration work. I do not feel free to go beyond that.

Q. Have these recommendations been adopted?

A. Partly so.

Q. I suppose Mr. Colmer does not visit this country, does he, regularly?

A. I do not think he has been out here for nine or ten years.

Q. I think you said something the other day that you did not think the location of the London office was suitable?

A. I do not think it is suitable, or rather, I think a very much more suitable place can be had with a view of bringing Canada to the front, in London.

Q. I suppose you made a recommendation of that kind?

A. Yes, I did.

Q. Has any other effort been made to remove it or to adopt your suggestion?

A. Not that I am aware of, although I think it is a subject that Mr. Sifton is now considering, and that perhaps it will reach some point, some possible solution, before he returns.

Q. Following that up, you have visited all the agencies in the United Kingdom, I presume?

A. Quite so.

Q. You have not agents, have you, in all the countries on the Continent?

A. No, we have an agent in Antwerp, Mr. DeCoeli, and there are two agents in Paris.

Q. Can you give any information as to the number of immigrants that have come from each of these agencies. I will take the United Kingdom. Take the case of Mr. Mitchell first.

A. No, there is no record of a return of the individual work of each of the agents—that is, the immigrants coming from the special efforts of each individual agent.

Q. Have they any means of keeping a record?

A. Well, they say not. I am inclined to think their view of it is correct. They are sowing the seed all the time.

Q. You made a personal inspection as far as you could of the work?

A. Quite so.

Q. What did you find in Mr. Mitchell's office?

A. How do you mean?

Q. You went to inspect his work there?

A. Yes.

Q. Did you merely pay a visit to the office and discuss matters generally with Mr. Mitchell and leave?

A. No.

Q. Or did your inspection go beyond that?

A. I went through the books and correspondence, trying to get an insight into the mode of work about everything in connection with the management of his department there.

Q. How long has he been there?

A. Since he was a boy, as I am told.

Q. Is he not a Canadian?

A. No, he told me he has never been in Canada. He grew up I believe with Mr. Dyke there.

Q. I suppose he does not know very much about Canadian affairs beyond hearsay?

A. I may say that he is a very good official, and has made himself pretty well acquainted with Canadian affairs.

Q. But he has no record of the number of persons that he induced to come to Canada?

A. He is in a somewhat different position. Take for instance, Mr. Jury; he is travelling most of the time, delivering lectures, and personally visiting those seeking information about Canada, whereas Mr. Mitchell's work is more of a clerical nature; and attending to the departure of immigrants by the steamships, keeping in touch with the steamship men. Then of course he had all the correspondence in connection with the continental work, also, on his hands, and in that respect I think there was

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a needless repetition of work between himself and the London office, and which is now stopped practically by the new arrangement on the Continent.

Q. Did you find Mr. Mitchell's work in a flourishing condition?

A. I found him very attentive and prompt in the discharge of his various duties.

Q. That is not quite an answer to the question I asked you. Did you find the work in a flourishing condition?

A. If you mean the distribution of the literature——

Q. I mean by way of success, in the way of inducing persons to come to Canada?

A. You will quite see, by looking at the returns, that the success has not been what was hoped for year after year, for one reason or another.

Q. Does Mr. Mitchell take a rather gloomy view of the prospects?

A. Sometimes he does, and sometimes he is more hopeful.

Q. He was not very hopeful when he made his report, was he?

A. No, I think he was not.

Q. He seems to think there will be a decrease, does he not?

A. Yes, we all came to that conclusion early in the year, and yet the returns up to the time I left seemed to point in the other direction, more particularly from Scotland.

Q. So the general view expressed and held, including your own, is that we must wait until the period of great prosperity which prevails there has somewhat passed over, before we can hope for much?

A. It is.

Q. You share that opinion yourself?

A. I do, quite apart from the troublesome difficulties of working the English field, which are many.

Q. Did you insist upon Mr. Mitchell's endeavouring to give you some idea of the number of persons that he was instrumental in sending out?

A. I went over there impressed with the idea that each of the agents ought to be able to point to stated results and I found that it seemed absolutely impossible to do it.

Q. Not even approximately?

A. With no degree of satisfaction.

Q. Did you suggest that an effort should be made?

A. I did not see any way in which it could be worked out and I do not know.

Q. Will you give the Committee some idea how you are going to judge, in the absence of some information of that kind, of the progress that is made in each of the offices of our agents?

A. Well, you can find in the returns, of course, from the offices in districts where the number of immigrants largely come from; but I find this, and I made up a statement with a very great deal of care, that really from the localities where the largest number of lectures and lantern slide exhibitions had taken place, the smallest number of immigrants were coming.

Q. I see.

A. So I was knocked out in the first round.

Q. Did you recommend discontinuing that?

A. I have come to the conclusion that the lecture business is largely a failure.

MR. FEATHERSTON—They want to stay at home and enjoy the exhibitions.

MR. WILSON—Especially the Indian part of it.

*By Mr. Rogers:*

Q. Did you attempt to ascertain what other countries are doing?

A. Yes, they are not in comparison by any means, with the exception of the assisted passages to Queensland, pursuing as active a policy as the Canadian Government is. They are depending very largely upon the booking agents upon distributing their literature.



*By Mr. Calvert :*

Q. Can you give us the cost to the Queensland Government ?

A. Last year they spent \$140,000 for bringing out 1901 immigrants.

*By Mr. Wilson :*

Q. What country ?

A. Queensland.

Q. But from where ?

A. From England.

Q. That is from Great Britain and Ireland, I suppose ?

A. I think it is altogether or pretty much all from England.

Q. They did, eh ?

A. Yes.

*By Mr. Macdonald (Huron) :*

Q. Why do you think that lecturing on the advantages of Canada, its climate and soil and all that, and giving lantern views have not had any effect ?

A. No, I will not say that, but the difficulty is to get people out to hear, that is the trouble. At almost everything of that kind the attendance is largely composed of children.

*By Mr. Clancy :*

Q. Have you recommended a discontinuance of that ?

A. We have not quite reached that point ; we are discussing it. Of course it is a very radical change, and one does not want to fly into it in a hurry, but it is looking in that direction. One phase of my recommendation has been adopted in Scotland. Whereas in 1898-9 they were delivering lectures nearly every night, this last winter they have been delivering, on an average, two a week and afterwards remained in the locality to see enquirers.

Q. And you are convinced from your observation that it has not borne the results expected of it ?

A. I think it has not, because they were expecting very great results from this for very many years, and the expectations have not been realized.

Q. Have moderate results been realized ?

A. Moderate results have been realized, but not, I think, sufficient to justify the expenditure of so much money and energy in lectures.

Q. Is it still being continued ?

A. It was, as I said, somewhat modified last fall.

*By Mr. Semple :*

Q. Do you think the agents should have discretion in the matter in that kind of work ?

A. Yes, of course the agent cannot go out and work on hard and fast lines.

*By Mr. Calvert :*

Q. According to your figures which you have given us the Queensland Government paid about \$75 for each immigrant secured by the assisted passage policy ?

A. \$75 in round numbers.

Q. What does it cost to bring them to Canada ?

A. I have not the amount here ; I think Mr. Pedley is preparing that.

Q. The other day, I think, we had it \$15.50 ?

A. That is my recollection.

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*By Mr. Macdonald (Huron) :*

Q. Do you act as Inspector for the American section ?

A. No, sir, I have nothing to do with the American section.

*By Mr. Clancy :*

Q. What are Mr. Jury's duties ?

A. Mr. Jury's duties have been to arrange for lectures, to attend fairs throughout England, sometimes he has gone to Wales and Ireland, when they have been pressed for assistance at the large fairs, to answer by personal visitation enquirers to the Liverpool office, keeping them until he gets a certain number from one locality so he will not have to take one trip to see one person, but may interview half a dozen or more.

Q. Does he give exhibitions of lantern slides ?

A. He has been doing that.

Q. When travelling ?

A. Yes.

Q. Under the recommendations you have suggested, does he still travel without doing that ?

A. No, of course where he travels to visit personally, there is no occasion for it.

Q. Are the annual reports of the agents circulated in England ?

A. I do not think so.

Q. Do you think it would be wise to circulate your reports which are circulated in Canada ?

A. I do not think there would be any special advantage in it.

Q. Do you think it would be wise ?

A. I do not see any advantage.

Q. Do you see any disadvantage ?

A. No, except the expense.

Q. The reason I asked the question is, that Mr. Jury states in his report, and I think you share the same view in your report, that we cannot expect tenant farmers to come to Canada.

A. That is my view.

Q. Mr. Jury states further in his report that tenant farmers are infinitely better off there than here.

A. That is the view I expressed the other day.

Q. That kind of literature would hardly induce that class to come here.

A. No, I do not suppose it would.

Q. Would it have the effect of being a deterrent to some intending immigrants ?

A. No, I do not suppose it would.

Q. If a man's prospects were better there as a farmer, could he be expected to come to Canada ?

A. I do not think he would ; I would be very sorry if he came.

Q. You think it is no use looking for that class ?

A. I do not think so under these circumstances.

*By Mr. Pettet :*

Q. You dealt with this question the other day ?

A. Yes, the other day.

*By Mr. Featherston :*

Q. There is quite a difference between farmers and farm labourers ?

A. Yes, and between farmers and farmers' sons.

*By Mr. Clancy :*

Q. Now about Mr. Griffiths, how long has he been in that country, Mr. Preston that is the agent in Wales ?

A. About two and a half or three years, or perhaps not so long.

Q. Is he a Canadian?

A. From Canada.

Q. He has had some experience?

A. He is a practical farmer.

*By Mr. Wilson :*

Q. About how old?

A. About 35 or 38; I have no personal knowledge.

*By Mr. Clancy :*

Q. What condition did you find Mr. Griffiths' office in?

A. When I went there Mr. Griffiths had no office, he was doing his work from his house.

Q. Well, what condition did you find his work in?

A. Very satisfactory.

Q. Had he any record of the numbers of persons he had sent out?

A. Well, he thought he had, and possibly he had more foundation for his claim than the other agents could establish, because he was working entirely in Wales and among the Welsh people.

Q. Did he have any record of the persons he had sent out?

A. He had a record but I do not know how complete it may be.

Q. He undertook to keep a record?

A. A record of those with whom he was in touch.

Q. Do you look on that as reliable?

A. Fairly so.

Q. He says he sent out some 200 people and was able to trace them to the land?

A. Yes.

Q. If that was possible for Mr. Griffiths would it not be equally possible for our other agents in Great Britain?

A. They could trace some and no doubt have traced some, from correspondence they have with them afterwards. Mr. Murray has been doing that work. You will find he gives the number leaving Scotland, according to his record.

Q. Do you think that it would be possible to enter upon a system of keeping better records than are kept now of the work done; namely, as a measure of the work to see how many persons they have been instrumental in inducing to come out?

A. I think there will be difficulty in doing so satisfactorily, but hope to try it.

Q. Have you made a recommendation of that kind?

A. I have not made a formal recommendation, but I have discussed it with some of the agents over there. In the Liverpool office, owing to the continental correspondence, they had a great deal of work on hand there, so that to my mind it was impossible to do more without having further assistance, but now that they are relieved of that work, I hope, before they start the fall work, to have something done.

Q. To have a more perfect record of the people coming to the country?

A. A more perfect record of those leaving the other side; as I told you the other day, there is a record kept here of the arrivals.

Q. Do you have to depend now upon the record of the steamship companies of the people coming here?

A. Well yes, largely, as they are leaving the other side.

Q. Does Mr. Mitchell have to depend on it?

A. Well, Mr. Mitchell must largely, of course—Mr. Mitchell has the advantage of seeing the passenger lists and if there is a large number for Canada it is cabled out here.

Q. Is there no more definite information?

A. He has some record in his office, but not one you would regard as satisfactory as the steamship records.



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*By Mr. Rogers:*

Q. It has never been done in the government offices ?

A. No.

*By Mr. Clancy:*

Q. Now, with regard to Mr. Murray, he is one of your agents in Scotland ?

A. Yes.

Q. He is able to give some information as to the number who came to Canada ?

A. Yes, from Scotland.

Q. He gives it at 1,803 people ?

A. Yes, of course he gets his returns practically from the steamship companies.

Q. Entirely ?

A. Yes, but he has a long list in the office, a record of those who he claims were sent out here, through the instrumentality of Scotch agents.

Q. Have you been able to ascertain whether that 1,800 people really came to settle in Canada ?

A. I have made no enquiries.

Q. Have you no means of knowing ?

A. They claim they have means of knowing. But I cannot speak from personal knowledge.

Q. Probably Mr. Pedley could give us that information from this end ?

A. Yes, the returns of the arrivals are entirely here.

Q. You have one other agent in Scotland.

A. There are Mr. Duncan and Mr. Grant.

Q. How long has Mr. Grant been over ?

A. About three years.

Q. He is a Canadian ?

A. He was living in Canada for some years but he is a Scotchman.

Q. Where did he reside ?

A. I only know by hearsay that he lived in Ottawa, but whether that is correct or not, I am not prepared to say.

Q. Was he able to give you any record of the work done in his office with regard to numbers ?

A. Not with regard to numbers, but he had a very satisfactory record of enquirers by letter or personally in his books. I found him well up in his business and doing good work.

Q. Would that apply with equal aptitude to Mr. Duncan's office ?

A. Well, Mr. Duncan was only appointed lately. He had been out on odd trips assisting the late Mr. Stuart in the northern part of Scotland, and was appointed permanently a few months ago.

Q. Is he a Canadian ?

A. He is a Scotchman, who was a member of the Manitoba Legislature, and farmed in Manitoba for a number of years.

Q. He was not able to give you a statement of numbers ?

A. He had no opportunity of doing it. I found him a most painstaking officer who was doing a great deal of personal work.

Q. Coming to Ireland, Mr. Devlin is styled 'Commissioner for Ireland' not an agent. Had you jurisdiction over Mr. Devlin ?

A. I think so, as to inspection.

Q. Did Mr. Devlin think so ?

A. I think so, he received me as if he was glad to see me, and there was no evidence of want of candour in his manner.

Q. What work does Mr. Devlin do ?

A. He addresses public meetings, gives lantern slide exhibitions, attends fairs, keeps in contact with the shipping agents, and is certainly pursuing an active immigration propaganda.

Q. Does he attend fairs generally?

A. I arrived at the conclusion that he does.

Q. Do you know as Inspector, that he does that particular work?

A. I know he assists in that part of the work, as I have letters from him in regard to it.

Q. I think he says something about it in his report here, doesn't he, at page 35.

A. Yes, in one of the last paragraphs.

Q. Well, one would draw from that that he does not, and that he leaves that to Mr. Webster? When he says that 'Mr. Webster will deal with the work done at fairs and exhibitions and that he cannot well absent himself from the office to attend fairs'?

A. You read further on and you will see he says, 'I content myself with giving Mr. Webster what assistance I can.'

Q. But he says he does not leave his office?

A. He does leave his office. If you read it you will be convinced of that. I know it as a matter of fact that he does.

Q. During the time you were there?

A. We have received in the London office, very frequently, papers referring to lectures which he gave at fairs.

Q. Mr. Devlin says in his report: 'Mr. Webster in his report will deal with the work done at fairs and exhibitions. I cannot well absent myself from the office to attend fairs.'

A. Yes.

Q. Is that true?

A. I am telling you what I saw at one fair, and it was very largely attended, and he was there, and I was also present at a lecture which he gave to a crowded audience.

Q. But he makes a particular statement that he cannot well absent himself from his office. What is the work of his office that he cannot leave it?

A. He does absent himself from his office, and of that I have personal knowledge.

Q. Has he any assistance?

A. He has a young lady typewriter.

Q. What is the nature of his work? Merely carrying on correspondence?

A. Carrying on correspondence, answering enquiries and attending to the duties of general manager of the office. I cannot tell you just exactly what he does from morning until night.

Q. I will read the whole of it over again so as to make it intelligent. 'Mr. Webster in his report will deal with the work done at fairs and exhibitions. I cannot well absent myself from the office to attend fairs, and with respect to our exhibits of agricultural products at shows, I content myself with giving Mr. Webster what assistance I can. There is perhaps no more valuable medium of imparting knowledge than the exhibit at a county show. It serves a double purpose,' and so on. From your inspection of Mr. Devlin's office, did you find that his work was such as to claim all his attention or nearly so?

A. I found, as I have endeavoured to make myself understood, attending one lecture; I found him attending one fair and was given to understand that he had attended others. Mr. Webster is given more immediate charge of that work, and Mr. Devlin assists him in it.

Q. Is it part of Mr. Devlin's work to attend fairs as well as Mr. Webster?

A. Yes, I think it is. I regard it so.

Q. Does he attend them?

A. I have been endeavouring to say that he does. I saw him there with my own eyes.

Q. Did you take any pains, Mr. Preston, to ascertain whether he attended fairs generally and gave lectures?

A. I know that he has been giving lectures generally, I am quite sure about that, and upon the other point I cannot speak any more than in a general way, that

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I understood he was doing so. But Mr. Webster is more particularly charged with that work, and unless the fair is a very large one, I imagine one attending it is quite enough.

*By Mr. Bell :*

Q. Have you seen many reports of lectures given by Mr. Devlin ?

A. I have.

Q. Numerous ?

A. Yes, I have.

*By Mr. Clancy :*

Q. Then you have not made any special inquiries as to whether these lectures were general or not, have you ?

A. I have tried to say I have made enquiry as to the lectures, and that I have seen reports of very many of them being attended and addressed by Mr. Devlin.

Q. Mr. Devlin states that his work is largely one of advertising ?

A. Yes, he uses that phrase.

Q. That would give the impression that his work was in the office and largely advertising, would it not ?

A. He would not be advertising in the office ; he would be advertising in the newspapers ?

Q. Beg pardon ?

A. He would be advertising in the newspapers, not in the office.

Q. Is that an answer ?

A. I think so. I may tell you frankly I am not going to parse every sentence in Mr. Devlin's report ; I cannot do it.

*By Mr. Talbot :*

Q. Outside of affairs of that kind, advertising, would he not be in the habit of giving lectures ?

A. He has been. I have been trying to say so.

*By Mr. Clancy :*

Q. Now, you said you did not pretend to parse every sentence in Mr. Devlin's report ?

A. Yes.

Q. Do you think he is responsible to report to you or to the High Commissioner ?

A. He is responsible to and reports to the High Commissioner.

Q. Do you not think that you as inspector, should have some knowledge of the work to which this report pertains ?

A. I do, and I have.

Q. Is it not a reasonable request to ask if that is a correct report of the work in his office ?

A. I am telling you what I know as Inspector, and beyond that I do not think I am justified in going. I think hon. gentlemen must draw their own conclusions.

Q. Did you visit the office after you saw this report ?

A. I never saw the report until I came here.

Q. If you had seen the report would you have enquired ?

A. I think I would ; I will when I go back.

Q. I suppose you would require a visit to Mr. Devlin himself to ask about his work generally rather than the mere work of the office. I understand you have already stated it came under your own personal observation.

Now about Mr. O'Kelly. What condition was his work in ?

A. In a very satisfactory condition. He was pressing on the immigration propaganda in the north of Ireland. Replying to enquirers and by personal work



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in the localities where he could get on the track of those who might possibly emigrate, and moving among a very satisfactory class of intending emigrants.

Q. He was unable, I suppose, like the others, to give any definite information as to the number he had been instrumental in sending out?

A. I saw him I think about last September or October, the last time I was in Londonderry. Then he came to Dublin to meet Mr. Smart and myself. Mr. O'Kelly has been able to keep track of a good many who had come out under his auspices from the north-west part of Ireland.

Q. He was unable of course to give you any definite information as to the number?

A. There is a natural jealousy of course, among them all, as to whether immigrants had come out under one or another. Mr. Devlin thinks a great many of his people come by Liverpool and are credited there, whereas they should go by Queenstown and he should be credited. Mr. O'Kelly on the other hand, thinks he is able to trace a good many of his because they go by Moville.

Q. None of them to go far enough to venture numbers?

A. Not in a way you would regard as satisfactory on the lines of your enquiry.

Q. Mr. Devlin suggests in his report that there is no record that gives any correct information of the number who come as intending immigrants to Canada by reason of some taking saloon passage?

A. Yes.

Q. That is, some who belong to somewhat of a more wealthy class, is it not?

A. Quite so.

Q. Is the bonus paid to the steamship company for these?

A. No.

Q. None?

A. No.

Q. That would form no portion then of the work of Mr. Devlin, would it?

A. You mean the bonus going in that way? Yes, certainly whether they are travelling saloon or second class or steerage, there is no cause why their coming should not be the work of agents.

*By Mr. Rogers :*

Q. Do you find the press in Great Britain and Ireland give any kind of a fair report of these meetings?

A. Some of them do.

Q. Do the press take any interest in them, or do they rather suppress them?

A. I think they did more in Ireland than in any other place, except in Wales. In Wales they give a very satisfactory report.

Q. It would be a great aid and assistance if they would?

A. Perhaps so.

*By Mr. Clancy :*

Q. You said the other day that all enquiries made at the respective offices of our own agents were communicated to the steamship companies and from them to the booking agents?

A. Quite so.

Q. Then that also held good with regard to the emigrants from the Continent?

A. There is a different system there altogether. The enquiries in the English offices from the Continent are very few, comparatively few, there are some from Scandinavia, but, however, it does not apply there anyway.

Q. Does it apply in France where you have your agents?

A. No.

Q. It does not apply there?

A. No.

Q. The failure to distribute literature was not confined entirely to the Continent, was it, that of which you complained?

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A. No, I do not think it was. But there were not the pronounced evidence elsewhere that there was on the Continent.

Q. Do you still depend on the booking agents in England to distribute our literature as well as on the Continent?

A. Quite so, that has been the practice to a certain extent, although a large quantity is distributed at fairs and by mail.

Q. What new method have you adopted to get over the defect you complain of, that it was allowed to remain without distribution?

A. By visiting booking agents and trying to get them more interested in Canada, but they all complain there is not very much of movement now, and not enough to justify taking any special steps.

Q. You have suggested no new mode of distributing literature there, have you?

A. No, I have not.

Q. And no new arrangements have been made?

A. No new arrangements have been made in England.

A. I should judge generally from the reports here that the outlook for the present, at least for any large number from the United Kingdom, is very doubtful?

A. That is the view I have. I may be wrong.

Q. What is your idea of the prospects of a desirable class of emigrants coming to Canada from the Continent?

A. I think the prospects are better.

Q. Bright?

A. I think they are fairly good—fairly good.

If the Committee will allow me I would like to refer for a few moments to the continental work. I will take it for granted that the Committee have done me the honour, at least, to look at my report in connection with the Continental work, and I might be permitted to say just here that the work upon the Continent is surrounded with very many difficulties. In the first place, on account of the restrictive laws in some of the countries in relation to carrying on an immigration propaganda. In Germany and Russia especially the restrictions are very severe. However these countries do not object to information being given to enquirers. They do object very strongly to any special pains being taken to give information to those who are not enquirers.

The circulation of certain literature has from time to time been the subject of communication, sometimes between the steamship agents and the Government of Germany. I have in my satchel here a letter written by the Minister of Commerce, I think it is, at Berlin, complaining that a permit given a steamship company to circulate certain literature had been, by one of the agents, construed to embrace a larger field, and he was directing the steamship company's attention to the fact this agent must be more careful in the future or his license would be taken from him.

Then every booking agent in those countries where there are restrictive laws cannot do business without obtaining a license from the Government authorities, for which he may have to pay anything from ten to twenty thousand marks to one hundred thousand marks; and among the provisions of the law is one that if he induces any emigrant to leave the country under false representations, the emigrant will have recourse against him, and can fall back on the deposit in the hands of the Government for the amount he has expended and the trouble he is put to. For that reason the agents are very careful.

But then there is a greater difficulty and this, I may say, is partly of a confidential character, in relation to which I made a confidential report to the Government in the closing days of last year. The transportation problem is the one to which I refer. In Germany no steerage passenger is allowed to leave Germany for America by any other than the lines licensed by the German authorities. No emigrant is allowed to leave Germany for Canada except by the one line that is licensed by the Government for that purpose—that is, to leave for Canada direct. The Hamburg-American line has secured the privilege from the German Government to land passengers in Canada, and they have been landing them in Halifax;

but the German Lloyds, the Cunard Line and the White Star Line have licenses to convey emigrants to Canada via New York. You will see that the Hamburg-American line has a monopoly of the direct immigration traffic to Canada. This gave them a lever with the view of bringing around what is known as the conference arrangement—not an amalgamation but such an arrangement with the other steamship companies whereby the whole European traffic is divided among the various lines, so that from the Continent of Europe outside of Scandinavia what is known as the German lines and Netherland lines taking in the traffic from Cronstadt on the Baltic to Havre in France, the traffic is in the hands of these companies to the extent of 94 per cent. Six per cent of the entire traffic is allowed to the White Star, the Cunard, the American, the Dominion and the Allan lines. That six per cent can only go from the Continent from points outside of Germany for the reasons that I have already explained, that the license from Germany direct to Canada is held by the Hamburg-American line, so you can very easily calculate that the number of passengers from Libau, Antwerp and Rotterdam, desiring to sail to Canada, far exceeds the number of 6 per cent which by the conference regulations the British lines, so called, are allowed to carry. Then if the British lines carry beyond the 6 per cent they must pay back into the pool at the rate of £3 for every man, woman and child carried by them. The steamship rates are fixed by the pool and those companies known as the British companies are allowed, when they find under the ordinary rates that they are going to receive more than the 6 per cent allotted them by the pool, to raise their rates, so as to prevent more than 6 per cent going their way. All the companies in Europe to-day, with the exception of one, carrying emigrants to America are in that pool, so you see we start out in the beginning with a discrimination against emigration to Canada of a very serious character.

So far one of the steamship lines has remained out of the pool and will likely this year carry a large number of the emigrants. On account of the German lines getting this 96 per cent from Europe they are prevented by the arrangement from competing for the traffic with the British lines from Scandinavia, leaving that to be exploited entirely by the British lines. The whole emigration traffic has been jeopardized by the pooling arrangement, and, as I have said, Canada is placed at a serious disadvantage. I have submitted to the Government that possibly something might be done to make matters better and ensure a regular service from Germany to Canada, by making arrangements with the Hamburg-American line. Whether that will be approved by the Government I cannot say. I would like to have an opportunity of approaching the Hamburg-American Company to see if a permanent steamship service can be arranged between Canada and Germany, with the view of there being as few difficulties as possible in connection with the work of emigration from these German points to Canada, and also to assist the trade relations between Canada and the Continent.

When I went to the Continent last year I soon arrived at the conclusion that the literature which had been sent there for years had not been distributed. As I have said in my report I found in some offices the accumulation of years. When I pressed them as to why this was so I found there was a good deal of unpleasantness in the race for the bonus. I found that it had practically degenerated among the agents into a scramble on the streets of the shipping ports for the bonus. There was no unity of feeling, no unification of aim on the part of booking agents of Europe with a view of bringing Canada to the fore. I also discovered that one of the shipping agents receiving the largest amount in bonuses from Canada, had been actually sending out from the principal office at Bremen, letters to people advising them not to come to Canada. This company had no connection, no direct connection with a transportation company running to Canada; they could only act through other agents, and therefore I suppose they had to divide the subsidy or bonus with them, and they were able to secure a larger commission upon the South American traffic. I have a copy of one of the letters to which I refer, in which the booking agent in question commences it as is the case with so many of the foreign booking



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agents, who commence their letters with setting forth "in the name of Jesus Christ" and then to pointing out how Canada is a very undesirable place to locate in. That is one of the reasons, as also the fact that I found this necessity for a community of interest between the booking agents that led me to the idea that something ought to be done so as to bring about, as it were, an amalgamation of booking agents. Upon enquiry I learned that view had already presented itself to Mr. Ballin, managing director of the Hamburg-American line, but he had failed to get them to work together upon the lines of pooling the bonus and dividing it afterwards. Seeing no possibility of bringing that about, I proposed to the High Commissioner that we should endeavour to make an arrangement with the largest number of booking agents, or the agents having the largest connections throughout Europe, so as to secure from them as active a legal propaganda for emigration as it was possible to bring about in the various countries. After negotiating for a good many months with the Department and with the London office upon that line, a policy was adopted which is now in operation. Under the present arrangement the bonus or subsidy is being paid, but work is being done, such work as I venture to say had never been attempted in Europe before. Those who are now in receipt of a subsidy or bonus know very well that they can only get it upon the one condition—by working—and that the more work they put in, the larger number of desirable emigrants they are able to induce to come to the country the larger will be the aggregate of the bonus. I think I can fairly claim that the result of this change will be beneficial.

*By Mr. Clancy :*

Q. How are you able to make the distinction between the persons who had intended to come and were seized upon at the last moment by the agents, in paying the bonus how can you make a distinction between those and the persons the agents were instrumental in inducing to come to Canada?

A. Those who were entitled to the bonus by the regulations and rules of the Department, and of course we had to have a rule in regard to it, were the agents actually booking the emigrants. They furnished the list to the Department of the names and the number, whom they booked from time to time, that being checked over by the steamship agents, and checked again upon their arrival in this country. I found I say, absolutely nothing was being done in the large emigration districts of Europe. Now the bonus is paid upon the record of arrivals of declared settlers from these countries.

*By Mr. Calvert :*

Q. I had thought of asking a few questions in relation to this. Perhaps I had better take the opportunity now. There has been so many questions asked, that probably I may be asking them over again. How did you find the emigration work for Canada, progressing upon the Continent, when you took your present position? I do not know whether you have discussed this or not, we have had so many questions.

A. I found it as I regarded it, in a very unsatisfactory state and duly reported the facts as I found them to the High Commissioner. Then I found in connection with this phase to which I was just referring, that in the same connection where that letter was written commencing 'in the name of Jesus Christ,' I went very thoroughly into the work of the firm and I asked them for the vouchers for the expenditures which they claimed to have made in the interests of Canada for a number of years and found they had not done any advertising about Canada for four years, nor had they sent any person into the immigrating districts for the purpose of canvassing for even a longer period, which strengthened my conviction, taken with other information I had, that the necessary work was not being done.

Q. Would you be so kind as to tell us what the work of the booking agencies covered, I mean with regard to the steamship companies.

A. It covered simply the selling of tickets. Under the new arrangement the agreement had to be very carefully drawn, incident to the restrictions on any immigration propaganda which might exist in any of the countries affected, but it provides for efficient organization, advertising, and canvassing personally and by letter, in all the great emigration centres in southern Europe and Russia.

Q. Are there any other probable immigration fields you have not visited over there?

A. I do not know that there are any fields in Europe, but from information which reached me in England a short while before I came across, I thought I would take the responsibility of informally suggesting to the Department that South Africa might furnish a profitable immigration field at no distant date. All the information that reaches London I may say, is that, at the conclusion of the war there, there is going to be a great deal of dissatisfaction among the Dutch settlers. I had come to the conclusion that possibly there might be some unity of action between the Imperial authorities, who are wanting to get rid of troublesome people there and this Government, with a view to bringing them to Canada, into a field where they could not be troublesome; I have seen since coming to Canada that they have been expressing their intention of coming to the United States. This is a question of policy. The Department has expressed no opinion upon it, but these people have proved, where free institutions are existing, admirable settlers. But however, that is a matter for the Department to consider.

*By Mr. Talbot:*

Q. Do you consider these a desirable class of emigrants?

A. I think if we can put them into the North West, under our free institutions, they would develop in a very short time into desirable settlers.

*By Mr. Calvert:*

Q. Is that your opinion of European peasants as settlers?

A. That is my opinion. In my report I think I said I have visited the peasantry of Europe in their own homes, more particularly in Austria, Hungary, Finland, Germany, Norway, Sweden, Denmark, Holland, Russia, Belgium and France, and they are all at home thrifty, hard working, honest, sober and with what one might characterize a growing intelligence.

Q. Have you already discussed the transportation rates, Mr. Preston?

A. No, I did not discuss the transportation rates, I will refer to that.

*By Mr. Marcotte:*

Q. Can you give us any information about the Stundists and Molohans?

A. Last year I visited the south-eastern part of Russia, Tiflis, about 300 miles east of Batoum, for the purpose of procuring information, more or less confidential, about people who wanted to come to Canada, the Molohans and the Stundists. The Stundists are German colonists, or rather the descendants of German colonists, who settled in Russia a hundred years ago and have preserved their nationality and are of the Baptist persuasion. The Molokans are something of the same class, peasants who are dissenters from the Russian Church. The Greek Church of course is all-powerful in Russia, and does not regard with kindness any of the dissenters. They have been subjected to persecution, although I think the efforts of the Church in that direction have been somewhat modified lately.

Q. They have been the subjects of persecution on the part of the Greek Church?

A. Yes.

*By Mr. Calvert:*

Q. Would you give us some information about transportation rates?

A. It might be of interest to the Committee to know what it costs the European peasant to reach Canada. Take from Odessa or Navorosisk on the Black Sea, which is something of an objective point, it costs each emigrant 11 roubles to reach Libau.

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*By Mr. Wilson :*

Q. Would you give us some idea of the value in our own money?

A. Yes, 22 shillings or 23 shillings. From Libau to Hull it is 18 roubles, 38 shillings; from Hull to Liverpool it is 5 shillings; from Liverpool to Quebec, 5 pounds 10 shillings, and from Quebec to Winnipeg, 2 pounds 10 shillings, making a total of about \$55 in Canadian currency.

*By Mr. Calvert :*

Q. Did you say from Liverpool to Quebec is 5 pounds 10 shillings?

A. Yes.

Q. Not for ordinary steerage?

A. Yes, either by the Allan or Dominion. That is the Convention rate. The Beaver line is carrying them for less.

Q. What do you estimate the whole cost to be?

A. Then take for instance from Finau or Cracow or Tarnapol in Hungary, it will cost about ten dollars to reach Hamburg and very few immigrants can reach Winnipeg by that route short of an expenditure of from fifty to sixty dollars.

Q. Simply for the passage?

A. Yes.

Q. That includes nothing for board?

A. Nothing for board. All under 12 years of age must pay one half rate. When you come to figure up that very few of these have families of less than six or eight you see it takes a good deal of money. One has to have a good deal of money to leave his old home before he can get into his new home, and I do not know that it is so well known in Canada, the trials that these people must have to undergo there before they are enabled to save sufficient money to bring themselves to a country like this and have a little money to start life again.

Q. That includes a limited amount of baggage of course?

A. Yes, that is allowed to come on. The question was raised here the other day as to what provision is made to prevent Galician criminals from coming out. Under the law as it exists in Canada, as also by the arrangement with this company, it is provided that all undesirable immigrants who reach our shores may be returned at the discretion of the Government, the cost of their transportation being a charge against the bonus earned by the syndicate or booking agents in question.

*By Mr. Wilson :*

Q. Have there been any returns that you know of?

A. There have not. I have here in my hand a return from the Statistical office of the names of persons brought from Galicia to Canada and I am sure the Committee will be pleased to know that out of 16,000 Galicians in the country, there is only a record here of six having been brought before the courts of Canada. Four of them were children, 10, 12 and 14 years of age for pilfering and they were allowed out on suspended sentence, and the others were the two who were hanged in Manitoba last year for murder. I think that furnishes a record that the Committee will appreciate.

Q. Is that report in the Blue Book?

A. No, I procured this from the Statistical office.

*By Mr. Marcotte :*

Q. They are good people, very good people.

A. Yes.

*By Mr. Clancy :*

H. How can you determine in the case say of the Galicians and Doukhobors—what their former pursuits in life were?

A. Does the hon. gentleman mean the Galicians or the Doukhobors?



Q. Take the Doukhobors for instance ?

A. That was before my time. I visited the Doukhobor settlements in the Caucasus Mountains, and they were said to be agriculturists. I saw the houses they lived in and the farms they cultivated, as I was passing through. The arrangement is that no bonus shall be paid except on agriculturists. Domestic servants, I think, are included, and no work is being done except in the agricultural districts of Europe. The bonus is not paid upon any going other than to Manitoba and the North West. I am free to admit that I think it is rather a restricted view, and that the time has come now when in the older provinces an opportunity should be given to induce people to come and fill up the population which has to so large an extent gone from the older provinces to the West.

*By Mr. Calvert :*

Q. There are millions of acres of land here ?

A. Yes, you have a great deal, and that is why I think we should have settlers. I had a talk with the Department about it and several interviews with Mr. Smart pointing out why, in the interest of Canada, the restricted policy of only getting people for the North West should not be allowed to proceed.

*By Mr. Clancy :*

Q. Had you an opportunity of enquiring into the information in the London office as to the Doukhobors ?

A. I saw the correspondence before I went over.

Q. They seemed to be satisfied they were agriculturists ?

A. As to that I can't say.

Q. I am going to read you from the report of one of our agents in the West, Mr. Crerar, of Yorkton. He says: 'There are eight villages on the north end of Good Spirit Lake in Townships 31 and 32, Ranges 5 and 6, west of the 2nd Meridian: there are also thirteen villages in what is called the North Colony, on the Swan River. These people have now good buildings in their villages; they are very handy with axes and other tools; they are all mechanics of some kind—carpenters, blacksmiths, waggon makers, tanners, shoemakers, harness makers, &c. Their women are also very clever at needle and fancy work, they also spin wool and weave same into cloth; in fact everything they use in wearing apparel these women make.'

A. Well, perhaps you will pardon me, Mr. Clancy, for explaining just here, that what our understanding of 'villages' is a very different thing from the understanding of the term 'villages' among the peasants; they do not reside on their holdings but in the village or community together.

Q. I am not talking about villages, but about that report ?

A. I am not acquainted with it, I was not in the Department.

Q. That is a rather striking fact I think.

A. I know they have to be handy in their own way.

Q. Not that they are handy but that they are tanners, blacksmiths, carpenters, &c., in fact that everyone has a trade.

A. I am able to do a little carpentering myself.

Q. But we are not seeking that class ?

A. We are not seeking that class, not at all. An honourable gentleman asked me how I got along in these foreign countries and the suggestion was made that I was employing an interpreter while in Europe. I may say that during all the time I was there I had no occasion to pay one shilling for an interpreter. As to my general expenses I will be glad to give any answers that may be asked either here or in the Public Accounts Committee.

*By Mr. Calvert :*

Q. Perhaps you might explain your personal expenses ?

A. If the Committee desire.

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*By Mr. Bell, (Pictou) :*

Q. Do you mean you never had occasion to have an interpreter?

A. No, what I said was that I never had occasion to pay an interpreter. When I visited the peasantry I had with me friends—on one occasion I had with me an Austrian friend; we were driving around—I was not paying him—he was coming as a friend with me, showing me the country. I found the English language, as far as towns and cities are concerned, everywhere in trains, hotels, custom houses, &c.

Q. But when you got into Russia?

A. I found—I was going to say more English was spoken in Tiflis than in some of the northern parts of Europe.

*By Mr. Marcotte :*

Q. In Russia?

A. Yes. You see my work is not with the peasants, I dare not attempt to carry on any emigration work with them. My work is with the booking agents and representative men.

*By Mr. Bell (Pictou) :*

Q. Do they speak English?

A. They speak English and understand it pretty well.

*By Mr. Marcotte :*

Q. In Russia?

A. I got on all right except in one instance. I was going to say in reference to my expenses that I would respectfully submit to the Committee, if any one of them wishes to ask me, that I have done with the Government money as I would have done with my own. I do not think they can find a case where there was unnecessary expense or extravagance on my part. I make that statement boldly.

*By Mr. Talbot :*

Q. What was your average expenditure daily?

A. I could hardly give you that, I have not a statement.

*By Mr. Rogers :*

Q. What condition did you find these peasants in, progressive?

A. I found them progressive. Their holdings are small and well cultivated; they get all they can out of the soil.

Q. They have horses?

A. Horses and cattle and fowls.

Q. I have seen reports of the women working on the farms?

A. I have seen such reports but I have seen as large a proportion of the female population working in England in the fields, and in Canada, too.

*By Mr. Clancy :*

Q. Do you think it desirable to continue to induce the class of Galicians to come to Canada?

A. The class which have come are desirable people.

Q. I mean those who have come?

A. I think they are desirable.

Q. I think you say that they did not compare after their journey with those you saw at home?

A. I know you won't misinterpret me; that is after they had travelled.

*By Mr. Marcotte :*

Q. Are they strong ?

A. Strong and healthy.

Q. Educated too ?

A. Yes. In Galicia vaccination and education are compulsory ; they are advanced in these regards.

*By Mr. Clancy :*

Q. They farm on a small scale ?

A. Yes.

Q. The change must be great going to the North West to farm on a large scale ?

A. Very much.

Q. Do you think the present generation can adapt itself to the changed circumstances ?

A. I think so from letters I have seen.

Q. It is a very great change, is it not ?

A. Yes.

*By Mr. Marcotte :*

Q. It is easier to cultivate here than there ?

A. They will waste nothing ; they will allow no ground to go to waste if they can cultivate it.

*By Mr. Bell (Pictou) :*

Q. What race are the Galicians ?

A. Polish, they belonged to the old Polish nation before the partition ; some are in Russia and some in Hungary.

*By Mr. Marcotte :*

Q. The authorities do not prevent these emigrants leaving ?

A. No, I think the Austrian authorities, from conversation with the Austrian consuls, are rather pleased that this country has been opened as an avenue for them. They will not allow you to go there and carry on a propaganda publicly, but they will allow you to answer enquiries.

Q. The same thing in Russia, well disposed ?

A. Well, there is no evidence that they are not well disposed. The authorities know that large numbers of people having conformed to the laws leave every year, and they have no objection to let them go where they will do well.

*By Mr. Clancy :*

Q. Russia is carrying on an immigration policy itself, is it not ?

A. Yes, to Siberia.

Q. And Prussia ?

A. We have to compete with all the countries in Europe.

*By Mr. Sproule :*

Q. You said this was a class Russia had wanted to get rid of ?

A. I must have been misunderstood. When on the Black Sea a Russian officer who thought I was an Englishman, said to me, 'If Russia had it to do over again she would never allow the Doukhobors to leave.' He spoke highly of them as a people, and of their services during the Crimean war.



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*By Mr. Rogers :*

Q. What about the emigration from Finland ?

A. Well, emigration prospects from there are not very satisfactory, the Imperial authorities are believed to be considering the institution of severe restrictive measures there. The Finns have decided not to place themselves in conflict with the St. Petersburg authorities.

*By Mr. Talbot :*

Q. Is there compulsory military service there ?

A. There is all over continental Europe.

*By Mr. Marcotte :*

Q. Are there any Mennonites coming to Manitoba ?

A. They have been there for some years.

Q. Have they made well there ?

A. They seem to have got along well.

Q. Did you visit them ?

A. No, but I passed through one of their places a few years ago.

*By Mr. Rogers :*

Q. The Finlanders will be very desirable emigrants, will they not ?

A. Yes, you can put down as desirable all that class of European manhood or womanhood.

*By Mr. Sproule :*

Q. How are the Finlanders succeeding in the United States ? Some reports I see are very bad.

A. I have not seen that.

*By Mr. Bell (Pictou) :*

Q. What are the prospects of Scandinavian emigration ?

A. I think they are rather improving. The prospects have not been very favourable, incident to the very good times that have been experienced in Norway and Sweden for a number of years. In a letter I got from there yesterday, from a leading booking agent in Gothenburg I learn that, from the enquiries that are being made, the outlook is better now than for a number of years. Then the emigration ran for so many years towards the United States that naturally the stream once being in that direction it has been very hard to stop it or direct it elsewhere.

Q. They are the most satisfactory of all are they not ?

A. I think all that population, the farming agricultural peasantry of Europe, are about the same.

Q. You think so ?

A. I think so. With the industry and thrift which they all, possess the probability of success is assured.

*By Mr. Clancy :*

Q. Did you prepare any part of the High Commissioner's report, or make any suggestion to him about it ?

A. I did not. In fact, it only occurred to me that on my way back from Russia, about the middle of December, that a report might possibly be expected from me. I had received no word to prepare one, and I wrote from Berlin or Hamburg asking the High Commissioner if I should send one, and I got a reply from there that he thought I had better send one in case it was asked for, and the report you have

there from me was written between sunset and sunrise and without any notes or preparation.

Q. Did you write the High Commissioner's report?

A. No, merely my own.

Q. Who prepares the High Commissioner's report?

A. It is natural to judge Mr. Colmer assists, the High Commissioner first outlining the general character.

*By Mr. Marcotte:*

Q. I saw in a newspaper an article saying that the French were not very desirable emigrants. I do not know whether it is well founded or not?

A. I do not know what you could have seen, I am sure. The emigration from France is not very large.

Q. I know it is not very large, but is it desirable?

A. I am perfectly frank in telling you that I have the same opinion of all the agricultural peasantry of Europe; I don't care from what country they come.

*By Mr. Sproule:*

Q. Did your examination extend to the Paris office?

A. That is not a general emigration office.

Q. What officers are in France for this Department?

A. Mr. Bodard and Mr. Foursin.

Q. Did your examination extend as to how they conducted their affairs?

A. Yes.

Q. I do not see any mention of it in your report?

A. I am explaining that the report was written without notes, and hurriedly, as I wanted to catch the first mail to Canada. It was not prepared with the care that it would have been had it been prepared in London.

Q. What is your personal observation as to how the work is carried on in France?

A. I think they have not a few difficulties to contend with in France, but I am not at all satisfied that we are getting all we might. I have tried to find out how they have been getting along and as I say, I am not at all satisfied with it; I do not know whether they are going to improve or not.

Q. Are they carrying on any work?

A. Well, I have not seen much to give me the impression that they are carrying on a very active work; they claim they are.

*By Mr. Talbot:*

Q. I suppose you have noticed that the French peasantry are not an emigrating class?

A. Yes.

Q. Do you notice that those who wanted to emigrate from France were more inclined to go to Algeria than to any other country?

A. I did not notice that.

*By Mr. Sproule:*

Q. What object is there in keeping up this office if nothing is being done?

A. The office in Paris is not an immigration office only, it is a commercial office also.

Q. As I understand it there are two men employed there?

A. Yes.

Q. They are attached to the Canadian office?

A. Yes.

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Q. If these men do no work and there is no chance of getting emigrants why continue the expense?

A. I do not say they are not doing work, they claim to be doing some work.

Q. Then what are the results?

A. They are not very satisfactory.

Q. That is what I thought.

*By Mr. Talbot :*

Q. They are commercial agents also?

A. That is partly the character of the Paris office.

*By Mr. Sproule :*

Q. Who are the agents there?

A. Mr. Bodard and Mr. Foursin.

Q. My recollection of it is that there were no emigrants at all from France last year.

A. There were emigrants returned in the report from France.

Q. How many?

A. The French and Belgium are classed together, there were 413.

Q. You do not separate them?

A. No, they are not separated in the return here.

Q. What agents have you in Belgium?

A. Mr. DeCoeli, who works in Belgium proper and goes into that part of Germany running into Luxemburg and with the Flemish and French people in Belgium, and also does some work in Holland.

*By Mr. Clancy :*

Q. Does Mr. Colmer have anything else in connection with his business as Canadian agent? Does he do any other work?

A. I am not acquainted with his business in that respect.

Q. Do you know that he does?

A. I cannot say that I do.

Q. Have you ever heard that he has?

A. I may have heard that he has interests in projects but I have no knowledge of it.

Q. Do you know as inspector whether he devotes his whole time to the work of the High Commissioner's office?

A. I am not inspector of the High Commissioner's office. I know that he is in the office, not only in office hours but outside of office hours. I have frequently found him there long after the ordinary hours apparently engaged in the duties of his office.

Q. Always doing the work of the High Commissioner's office?

A. That I don't know. I am not in his office so I don't know.

Q. Has he more than one office?

A. The immigration office is on the left hand side of the corridor as you go in and Mr. Colmer's office is on the right hand side. On the left hand are the library and general waiting room and also the treasurer's and immigration offices.

Q. Has it been rumoured there that Mr. Colmer was—

A. Don't ask me to indulge in rumors, Mr. Clancy, I think it is hardly—

Q. I am going to press the hon. gentleman. If Mr. Colmer, in the High Commissioner's office is engaged in the emigration work to Canada, the reports are all made to the High Commissioner and are under his notice, and I ask Mr. Preston whether he has any suspicion that Mr. Colmer does not devote his whole time to the High Commissioner's office for which Canada pays?

A. I submit that is not a question for me to answer,

Q. Do you refuse to answer it?



A. I have nothing to do with Mr. Colmer.

Q. I am asking if you decline to answer the question?

A. I certainly decline to answer any question that has to be based on a suspicion.

Q. Did you ever take any trouble to enquire there, whether Mr. Colmer did devote his whole time to the work of the High Commissioner's office?

A. I have said that I found him in his office, in office hours, and very often long after office hours.

Q. Have you any idea apart from any rumour that Mr. Colmer is engaged in anything else than his work in the High Commissioner's office?

A. I must submit that is not a question for me to answer.

Q. You refuse?

A. I certainly decline to answer that question.

*By Mr. Sproule :*

Q. As inspector of agencies, don't you think it is your duty to enquire into every agency on the Continent, to find if the men are devoting themselves to their work, and don't you think it would be your duty to enquire into Mr. Colmer's conduct?

A. I do not find anything in my instructions directing me to enquire into Mr. Colmer's work.

Q. What is he?

A. Secretary to the High Commissioner.

Q. Does he not do work in connection with immigration as well?

A. He had largely charge of it before I went there, in fact he has charge of what you might call the correspondence part, now.

Q. Don't you think it is necessary to inquire into how it is done now?

A. I think it would be hardly fair for me to express any opinion about it. Mr. Colmer and I have not seen eye to eye with regard to immigration work, either on the Continent or in England, and the matters in dispute will have to be settled by the Government.

Q. We have not Mr. Colmer here but we have you here, and we can examine you as to such information as will enable us to make suggestions to the Government as to the mode of carrying on the work in the future, and it is only in that way that we can reach the advantages or defects of it.

A. Kindly let me have your question.

Q. My question is as an immigration agent, do you not regard it as part of your duty as Inspector of agencies to inquire into the conduct of whatever branch of it Mr. Colmer was carrying on and whether he was devoting his time to it assiduously or not?

A. I do not regard it as part of my duty to enquire into Mr. Colmer's work in the High Commissioner's office. Mr. Colmer and I have not seen eye to eye in relation to the policy to be pursued in regard to immigration work either in England or the Continent. It has been almost a continual—perhaps dispute is too strong a term—but not agreement between us in relation to the carrying on of the work.

Q. I do not think there is anything out of place now as regards the difference of opinion, but I want the knowledge or such information as will enable us to make suggestions as to a change of system.

*By Mr. Featherston :*

Q. Or in other words we want you to condemn Mr. Colmer.

After further discussion the Witness said: 'I beg respectfully to protest that you have no right to put words in my mouth even if I am here as a witness before this Committee. I did not to the slightest extent, even by inference, I submit to the members of the Committee, convey the impression that I was condemning in any way Mr. Colmer's work. I said Mr. Colmer was attending to business in his office late and early and I do not know why I should be pressed as to his qualifications or

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business that he may or may not be engaged in outside of the office. I will not answer such a question upon suspicion no matter who may ask it.'

*By Mr. Sproule :*

Q. Any member has a right to ask any question.

A. When a member of this Committee asks me in relation to the private business of an officer, over whom I have no jurisdiction whatever, it is pressing me to a point where I think patience ceases to be a virtue.

Q. I say it is not treating the Committee with respect for any witness brought here to either dictate to the Committee or say that a member is asking him an impertinent question, and in connection with this, I say that any man engaged in emigration work there, I do not care who he is or in what capacity, it is quite proper and in the right of any member to enquire how the work is being done, and get such information, as will enable him to do his duty to the House, because he has got to enquire into everything and make such suggestions as are proper.

The CHAIRMAN ruled :—'As far as immigration is concerned any gentleman coming before the Committee, from the Old Country, may be examined fully on that question, but he has no right to go into the office of the High Commissioner and be an Inspector there or to make any statements in respect to any official in the High Commissioner's office, who is not under his charge.'

Mr. SPROULE.—But is not Mr. Colmer an immigration agent?

The CHAIRMAN.—If he is, he is under the High Commissioner's control.

Mr. SPROULE.—And the Inspector of agencies goes there to examine into these agencies, and as Mr. Colmer is one of the agents, you must examine his agency too.

Mr. TALBOT.—The question was pressed on Mr. Preston as to the qualifications of Mr. Colmer and he refused to answer. I should have thought the matter was ended there and then. Mr. Sproule got up and pressed it, but I submit the answer was given.

Mr. CLANCY.—Mr. Talbot has raised a question not in the discussion. I have not raised the question of the qualifications of Mr. Colmer in any sense, but I have raised an important question. If Mr. Preston came here and said, 'I have no knowledge, but it came to my ears and I have made a confidential report,' it would be all right, but when Mr. Preston comes here as a servant of the country—and he must remember he is a servant of this country——

Mr. PRESTON.—I remember it quite well, but I do not allow any one, even a member of the House of Commons, to put words in my mouth which I did not use.

Q. The immigration report you said was Mr. Colmer's?

A. I beg the honourable gentleman's pardon, I said it was Lord Stratheona's report, probably prepared for him by Mr. Colmer as his secretary and at his dictation.

Q. That is the same thing. I will leave that, however. If there was a rumour in the city of London that any person in connection with the department of immigration was engaged in anything except that work in the High Commissioner's office, Canada ought to know it, and I tell Mr. Preston he is remiss in his duty if he has not reported it to the Government, although he won't report it to the Committee. Canada has a right to know if Mr. Colmer is doing his duty there. I am not going to press for the answer when you say, Mr. Chairman, that this Committee has no right to the information, but we have a right to ask Mr. Preston if the rumour ever came to his notice and if he reported it.

A. Does the hon. gentleman really ask me to report to this Committee on rumours?

Q. I ask him now if he has reported—first if such a rumour was made to that effect?

A. To what effect?

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Q. To the effect that Mr. Colmer was engaged in work other than that exclusively connected with Canada?

A. I would be sorry to report on anything in the nature of a rumour; I can find something else to do.

The CHAIRMAN.—Mr. Preston has no right to answer any question as to the secretary of the High Commissioner in London; he is not under him, he is under the High Commissioner.

*By Mr. Talbot:*

Q. You have said you do not see eye to eye with Mr. Colmer?

A. I have.

Q. Have you any objections to stating in what respect?

A. I have not.

*By Mr. Sproule:*

Q. We pay Mr. Colmer his salary and it was raised last year; we pay him a respectable salary. When this item was under discussion it was asked what his duties were. Among these were emigration, and we understood he was the important immigration agent in London. Now as that important immigration agent these things are assigned to us to investigate every phase and report our observations, findings or suggestions to the House; so that the House may deal with these questions when they come before the House. To do that we require to get more information than there is in the report and we bring before us the Inspector who is appointed to enquire into these matters while over there. As Inspector, he has a right to inquire into whether Mr. Colmer is performing his duties properly, and it is in connection with that that the question is asked Mr. Preston, and as members of this Committee we have a perfect right to expect a reasonable answer, not to be lectured by one of the officers that are brought before us to give information. It must be in the judgment of the Committee what questions they will ask and not in the judgment of the witness.

A. If the hon. gentleman will refer to the act establishing the High Commissioner's office he will find the question of immigration in Great Britain especially chargeable in its responsibility to the High Commissioner's office, and Mr. Colmer raised the question the day after I reached London that as inspector of immigration agencies, simply producing a letter of instructions from the Department of the Interior, I had no standing as against that office. However, that question having been raised I do not wish to put myself in a false position or have an impression go out as to the meaning I intended to convey in my reply to Mr. Clancy. I do not know what steps were taken by Mr. Colmer to raise that point at Ottawa, but that point is unsettled so far as my knowledge is concerned. I told Mr. Colmer it was for him to see whether my field was limited, but I was going about my work in England regardless of this statement of his view.

Q. That is an important statement. I would like to ask Mr. Preston if the point raised was submitted to the Government?

A. Not by me.

Q. The High Commissioner is under the Government of Canada and must answer to Parliament the same as anyone else. It was raised by Mr. Colmer?

A. Yes.

Q. Are you aware he submitted his objections?

A. No; I told him it was for him to find that out; it was not for me.

Q. Did you enter upon your duties with the belief, till the point was raised, that he was under your jurisdiction?

A. No, not in the sense conveyed by the hon. gentleman, but at least that I had the privilege of examination of everything connected with emigration; and no obstacle was placed in my way by Mr. Colmer or anyone else while I was there.



## APPENDIX No. 1

Q. Was that point raised soon after your arrival?

A. The day after my arrival.

Q. Did he place the files and records at your disposition afterwards?

A. Every time I requested papers, they were given.

Q. But had you access to his books and papers generally?

A. Yes, and yet not in a satisfactory way and the point has not been settled at Ottawa yet, or by the Department. I claim that I should receive when in London, every day, all the correspondence and everything else connected with immigration upon my desk in the morning, and that has not been done. I have frequently had to go and look for such papers as should be given to me, and in that regard I do not think I have the standing in the office I thought I ought to have.

*By Mr. Clancy:*

Q. You went there with the impression that I am sure was uppermost in the minds of every gentleman here, with full authority to enquire into matters to which you have just referred.

A. And no obstacle was thrown in the way of my enquiry.

Q. When that point was raised by Mr. Colmer, you having received your letter of instructions from the Minister of the Interior, did you report that difficulty to him?

A. I reported that to him in an informal way.

Q. Did you ever report to him in writing?

A. In writing, of course, but it was not an official letter. It was more of a private letter.

Q. Has the Minister, as far as you know, taken any steps to clear up that point?

A. I do not know what steps, but I believe he has taken some.

Q. Did he give you any instructions following or in response to the informal communication you made to him?

A. Yes.

Q. When was that?

A. Some time last year.

Q. Immediately following the time you assumed your duties?

A. Shortly after I got a letter from the Deputy Minister in which I was told to proceed quietly with my work. Of course there is no doubt about this, that I feared from the beginning there would be some friction in the office when I went there and it has not been without some phases of it being realized. I did not go there with the idea of being simply subordinate to Mr. Colmer's views on immigration matters, and I was given as I said somewhat wide powers as to the work I should do and the liberty I should have in making suggestions. Suggestions I have made have not met with Mr. Colmer's approval and I have had in that sense to press them with, perhaps, undue persistence to the point of getting some of them carried out.

*By Mr. Rogers:*

Q. What view did the High Commissioner take?

A. I think that is hardly a question for me to answer. Personally Mr. Colmer and I are good friends.

*By Mr. Clancy:*

Q. Suppose Mr. Colmer had acceded to your request when you went there and that part relating to the immigration of Canada came under your jurisdiction, suppose he had acceded to your request, and had not raised the point that you have stated a moment ago, in that case would you have thought it a part of your duty to see that Colmer devoted his whole time to the work for which Canada was paying him?

A. No, in that case all the immigration matters would have come into my own hands. In that event he would have been outside of the immigration staff, engaged with his other official duties, and his name then could not properly be a subject for discussion in this Committee.

---

Having examined the preceding transcripts of my evidence, I find them correct.

W. T. R. PRESTON,

*Inspector European Emigration Agencies.*

# APPENDIX





## APPENDIX No. 1

## RESOLUTIONS ADOPTED BY THE COMMITTEE.

The following resolutions were adopted by the Committee as recommendations for the promotion of the agricultural interests of the Dominion :—

## No. 1.—TO TAKE DOWN EVIDENCE.

Moved by Mr. Sproule, seconded by Mr. Stenson, 'That the Committee ask authority from the House to employ a shorthand writer to take down such evidence as they may deem proper.'—Motion adopted.

COMMITTEE ROOM 46,  
February 20, 1900.

## No. 2.—MULTIPLE COPY OF EVIDENCE.

Moved by Mr. Sproule, seconded by Mr. McNeil, 'That the evidence taken before the Committee, to-day, regarding Beet Root Sugar, cultivation of Sugar Beet, &c., be typewritten forthwith, and a copy of it placed before the Right Hon. the Premier, the Hon. the Minister of Finance, the Hon. the Minister of Agriculture, and other Members of the Privy Council.'—Motion adopted.

COMMITTEE ROOM 46,  
March 15, 1900.

## No. 3.—PRINTING EVIDENCE IN PAMPHLET FORM FOR DISTRIBUTION.

Moved by Mr. Semple, seconded by Mr. Wilson, 'That it be recommended by Report, that the House authorize the printing of the evidence of Dr. W. Saunders and of each of the other members of the Official Staff at the Central Experimental Farm, in pamphlet form, as advance sheets of the Committee's Final Report; the numbers to be thus printed based on that authorized by the House, in 1899.'—Motion adopted.

COMMITTEE ROOM 46,  
May 2, 1900.

## No. 4.—ADDITIONAL PRINTING OF EVIDENCE IN PAMPHLET FORM, FOR DISTRIBUTION.

Moved by Mr. Burnett, seconded by Mr. Wilson, 'That the Committee recommend the following evidence be issued in pamphlet form, viz. : those of Prof. Robertson, Commissioner of Agriculture and Dairying; Dr. McEachran, Chief Veterinary Inspector; and of Dr. Higginson, Veterinary Surgeon, to the number of 20,000 copies each, in separate pamphlet form, in the usual proportions of English and French; 15,000 copies

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of each to be distributed to Members of Parliament; 4,900 copies to be allotted to the Department of Agriculture for distribution; and 100 copies of each to be for use of the Committee.'—Motion adopted.

## No. 5.—COMPLIMENTARY VOTE TO THE CHAIRMAN.

Moved by Mr. Clancy, seconded by Mr. Graham, 'That this Committee have much pleasure in tendering a cordial vote of thanks to their Chairman, Mr. McMillan, as an expression of their high appreciation of the manifest ability and fairness with which he has discharged the onerous duties of The Chair in the management of the various considerations that have come under the review of the Committee, in the current Session of Parliament.'—Motion adopted with unanimous applause.

HOUSE OF COMMONS, COMMITTEE ROOM 46,  
July 3, 1900.

---

The preceding resolutions are true copies as recorded in the minutes of meetings of the Select Standing Committee on Agriculture and Colonization, on the respective dates specified.

J. H. MACLEOD,

*Clerk to Committee.*



## APPENDIX No. 1

## INTERIM REPORTS.

## FIRST REPORT.

The Select Standing Committee on Agriculture and Colonization present their First Report, as follows :—

The Committee recommend that the House grant them authority to employ a shorthand writer to take down such evidence as they may deem proper.

JOHN McMILLAN,

*Chairman.*

HOUSE OF COMMONS,  
February 20, 1900.

*Report adopted by the House, February 20.*

## SECOND REPORT.

The Select Standing Committee on Agriculture and Colonization present their Second Report, as follows :—

The Select Standing Committee on Agriculture and Colonization, to whom was referred Bill No. 2, 'An Act to amend the Fertilizers Act, 1890,' by order of the House on March 14 current, present their report thereon, and recommend the said Bill be amended as follows :—

That the word 'ground' be inserted between the ninth and tenth words of the sixth line thereof, and that all the words after 'slag,' in the said sixth line, to the end of the seventh line, be struck out and the following substituted instead thereof: 'or Thomas phosphate powder, at least five per cent of available phosphoric acid soluble in a neutral solution of citrate of ammonia.'

A copy of the said Bill, as proposed by the Committee to be amended, is annexed to report.

JOHN McMILLAN,

*Chairman.*

HOUSE OF COMMONS,  
March 29, 1900.

*Said 'Bill No. 2,' as referred to the Committee :*

1. Section 12 of chapter 24 of the statutes of 1890 is hereby amended by adding after the word 'acid' in the eleventh line thereof the words 'and in the case of basic slag not less than . . . . units of phosphoric acid.'

*Said 'Bill No. 2' as amended by the Committee :*

1. Section 12 of chapter 24 of the statutes of 1890 is hereby amended by adding after the word 'acid' in the eleventh line thereof the words 'and in the case of ground

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basic slag or Thomas phosphate powder at least five per cent of available phosphoric acid soluble in a neutral solution of citrate of ammonia.'

*The House adopted no action on this report.*

## THIRD REPORT.

The Select Standing Committee on Agriculture and Colonization present their Third Report, as follows :—

The Committee recommend that the evidence on agriculture taken before them during the current Session of Parliament, be printed forthwith in the usual numerical proportions of English and French, as advanced sheets of the Committee's Final Report, for distribution to Members of Parliament, as hereinafter specified, that is to say :

1. Twenty thousand (20,000) copies of the evidence of Dr. Saunders, Director of the Dominion Experimental Farms ; fifteen thousand (15,000) copies thereof to be for distribution to Members of Parliament ; four thousand nine hundred (4,900) copies for distribution by the Department of Agriculture, and one hundred (100) copies for use of the Committee.

2. Twenty thousand (20,000) copies of the evidence of each member of the official staff at the Central Experimental Farm, of which nineteen thousand four hundred (19,400) shall be for distribution to Members of Parliament ; five hundred (500) copies of his own evidence to be allotted to each member of said staff, and one hundred (100) copies of each to the use of the Committee.

JOHN McMILLAN,

*Chairman.*

HOUSE OF COMMONS,

May 2, 1900.

*Report adopted by the House, May 2.*

## FOURTH REPORT.

The Select Standing Committee on Agriculture and Colonization present their Fourth Report, as follows :—

The Committee submit herewith, for the information of the House, the evidence taken before them in the current Session, on Immigration and Colonization.

And the Committee recommend that the said evidence be allowed to form part of their Final Report.

JOHN McMILLAN,

*Chairman.*

HOUSE OF COMMONS,

June 27, 1900.

The Committee's Fifth and Final Report was presented on July 4, and, on motion of Mr. McMillan, was adopted by the House on July 5, *vide* 'Votes and Proceedings, Nos. 103 and 104 ; pp. 755 and 765.'

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Can  
Com  
A

# REPORT

OF THE

SELECT STANDING COMMITTEE

ON

## AGRICULTURE AND COLONIZATION

FOURTH SESSION, EIGHTH PARLIAMENT

1899

*PRINTED BY ORDER OF PARLIAMENT*



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE QUEEN'S MOST  
EXCELLENT MAJESTY

1899





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## THE COMMITTEE.

(THOMAS BAIN, Esq., *Chairman.*)

Messieurs :

Bain,  
 Bazinet,  
 Beith,  
 Bell (*Addington*),  
 Bell (*Pictou*),  
 Bergeron,  
 Bernier,  
 Blanchard,  
 Bostock,  
 Bourassa,  
 Bourbonnais,  
 Broder,  
 Burnett,  
 Calvert,  
 Campbell,  
 Cargill,  
 Carscallen,  
 Casey,  
 Christie,  
 Clancy,  
 Cochrane,  
 Davin,  
 Déchêne,  
 Demers,  
 Douglas,  
 Dugas,  
 Dupré,  
 Dyment,  
 Edwards,  
 Erb,  
 Featherston,  
 Ferguson,  
 Fisher,  
 Frost,  
 Gauthier,  
 Gibson,  
 Gilmour,  
 Godbout,  
 Graham,  
 Guillet,  
 Guité,  
 Haley,  
 Harwood,  
 Henderson,  
 Hodgins,  
 Hughes,  
 Hurley,  
 Hutchison,  
 Ingram,  
 Joly de Lotbinière (Sir Henri),  
 Lang,  
 LaRivière,  
 Leduc,  
 Legris,  
 Lewis,

Macdonald (*King's*),  
 Macdonell,  
 Mackie,  
 MacLaren,  
 McCormick,  
 McGregor,  
 McGugan,  
 McHugh,  
 McInnes,  
 McLennan (*Glengarry*),  
 McLennan (*Inverness*),  
 McMillan,  
 McMullen,  
 McNeill,  
 Marcil,  
 Marcotte,  
 Martin,  
 Maxwell,  
 Meigs,  
 Monk,  
 Montague,  
 Moore,  
 Morin,  
 Morrison,  
 Mulock,  
 Oliver,  
 Parmalee,  
 Pettet,  
 Pope,  
 Poupore,  
 Proulx,  
 Ratz,  
 Reid,  
 Richardson,  
 Rinfret,  
 Robinson,  
 Roche,  
 Roddick,  
 Rogers,  
 Rosamond,  
 Rutherford,  
 Seagram,  
 Semple,  
 Sproule,  
 Stenson,  
 Stubbs,  
 Sutherland,  
 Talbot,  
 Taylor,  
 Tolmie,  
 Tucker,  
 Turcot,  
 Tyrwhitt,  
 Wilson.





# REPORT

The Select Standing Committee on Agriculture and Colonization present their Fifth and Final Report, as follows :—

The investigations of the Committee during the current Session of Parliament, included, *First*,—Agriculture in its correlative phases of Production and Commerce ; *Second*,—Immigration coupled with the settlement of new arrivals upon homesteads in Western Canada, in 1898.

The evidence taken by the Committee on each of these divisions of inquiry, is appended hereto as an essential portion of this report.

The Committee recommend that the evidence herewith, on immigration and homesteading by immigrants, be printed forthwith, in order to the immediate publication of this entire report, in one volume.

Respectfully submitted,

THOS. BAIN,  
*Chairman.*

House of Commons,  
1st August, 1899.



THE EVIDENCE

PART I

INCLUDING

AGRICULTURE AND DAIRYING

IN

CANADA





## FATTENING OF CHICKENS.

COMMITTEE ROOM 46,

HOUSE OF COMMONS,

TUESDAY, 2nd May, 1899.

The Select Standing Committee on Agriculture and Colonization met here this day at 11 o'clock a.m.; Mr. Bain, Chairman, presiding.

MR. JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying, was present at the request of the committee, and made the following statement :

Mr. Chairman and Gentlemen,—I had proposed to lay before the committee this morning what I think to be the most important statement I have made before any committee in regard to the agriculture of Canada ; but since the chairman says he would be pleased to have a larger number of members present, and since that would also be quite agreeable to myself, if you will allow me, I will lay before you this morning a statement on the fattening of chickens, and reserve the subject of general agriculture for a future meeting.

## THE DEMAND FOR HAM AND CHICKEN.

I found in Great Britain last year a change in the class of food that is in most demand. I found, first of all, that it is no longer fashionable to serve cheese on the tea tables of the people. In farmhouses and towns I found the women, saying that it is "not good form" to offer cheese to guests ; and the grocers and provision dealers told me that was making an appreciable difference in the sales of cheese. I found a growing demand everywhere for lean bacon, ham and well-fattened chickens ; and by looking into the preferences of the people, as shown in hotels, railway restaurants and private houses, I found that cold ham and chicken were in far more common use than before. These two go together, and are becoming an almost typical fare of the population south of Liverpool.

The trade returns of Canada, show an enormous growth in the exports of bacon. In 1891, the total exports were a little over six hundred thousand dollars, and in 1898, these had grown to eight and a half million dollars worth of pork, bacon and hams from Canada to Britain, a tremendous increase in these few years.

*By Mr. McNeill :*

Q. Will you kindly repeat those figures ?

A. In 1891, the exports were \$632,558, and \$8,092,930 in 1898 ; for the years ending 30th June, in both cases.

Q. For bacon and hams ?

A. For pork, bacon and hams ; and for the six months ending 31st December, 1898, the exports were valued at \$5,690,995 for the six months only.

The chickens that are eaten with cold ham in Britain are specially fattened chickens ; and as different from common thin chickens as the beef of lean steers would be from well fattened flesh ; as different in flavour, tenderness and in the percentage of edible portion in the total amount that is paid for.

## WELL-TO-DO FARMERS FATTEN CHICKENS.

I did not find that the men who fattened chickens in Britain were poor farmers who had no other means of making a living. In Canada there is an idea that it is only poor farmers who can do nothing else, who may raise chickens. The people who raise and fatten chickens in England are to be found South of London, between London and the English Channel, on about the richest part of the island, with the finest situation, close to the best markets. These are the men who have developed the chicken fattening industry, not the faraway, ignorant, incapable and poor farmers, but the men who are in the best position as to locality and soil of any in the British Isles. Then across the channel, in the North of France also, chicken-raising is carried on; so that in the two parts of the European countries which are the richest, we find chicken-fattening. The business is not for the out-of-the-way farmer of Canada alone. I learned also that there is money in the business, and instead of reasoning that out in the abstract, let me tell you in simple narrative what I found when last year I made the acquaintance of a chicken fattener near Uckfield, who is known as one of the best poultry fatteners in Britain. I had got the name of Mr. Samuel Taylor from one of the leading poultry dealers in London. When I got to his place I found Mr. Taylor was a successful farmer. He had begun life as a farm labourer without capital. When I visited him he had a fine farm-stead and was doing a prosperous business. I would not like to say how much money the chicken-fattening business brought him in; but I would not be surprised to learn that his annual net balance was over £1,000. This man had begun life as a farm labourer, and by sticking to this business had made money out of it. Chicken-fattening is not to be sneered at as a small affair; some of the biggest profits are made out of small things.

## AS CARRIED ON IN ENGLAND.

Mr. Taylor had on an average four hundred dozens of chickens fattening at his place. In approaching his house, I may say that I went down a lane which was lined on both sides with coops, in which there were chickens; and around the stackyard and in a few open sheds there were some more. The special buildings required for this purpose were cheap and not at all large. Two-thirds of the fattening was done in the open air. Mr. Taylor did not rear one-tenth of all the chickens he fattened. He had a man who went around on certain routes every fortnight, collecting chickens from the farmers who were in a sense his patrons. The farmers and cottagers brought them up to about  $3\frac{1}{2}$  pounds live weight; and then sold them as they ran. The chicken-fattener collected them and paid on an average one and nine-pence apiece for these chickens—42 cents each in our currency. He sent around and collected them from his customers regularly every fortnight. Those who raised the chickens were sure of a regular market and good prices.

*By Mr. Calvert:*

Q. Would he pay that much for any number?

A. Yes, but they had to be of fair size, say from 3 to  $3\frac{1}{2}$  pounds live weight. They were not exceptionally large chickens and no better than chickens we could raise here.

The coops in which the chickens were put for fattening were about  $6\frac{1}{2}$  feet long and about 16 inches square inside. Each coop was divided into three compartments, and in each compartment there were five chickens, making 15 chickens in each coop. The coops were constructed by using sticks or rods, such as we would call slats; and in some cases small hazel rods such as are used for heavy basket making. A little sliding door in front of each compartment gave a chance for the chickens to be taken out when that was required. The chickens were fed for about three weeks,



sometimes a little less, sometimes a little longer, according to the condition of the chickens when received and the activity or dullness of the market. The chickens were fed on oats ground very fine, the hulls being pulverized until they were almost like dust, mixed with skim milk either sweet or sour, preferably sour. The mixture had a consistency about as thick as thin porridge, so that from the end of a wooden spoon it would drop off but not run.

*By Mr. Rutherford :*

Q. Was it fed raw ?

A. It was fed raw. In front of each coop was a small wooden V shaped trough. The chickens could put their heads through between the slats of the coup and eat out of it.

*By Mr. McNeill :*

Q. Was it fed just as it was mixed or was it allowed to stand for a time ?

A. Both ways. Sometimes in the morning it was mixed for a day's supply ; and sometimes it was fed just after it was mixed. That made no difference. The meal was ground fine ; it did not require much soaking to make it soft. The chickens were fed a small allowance of the mixture three times a day at first. A man took a pail and a wooden stirrer, such as would be made in the country from part of a shingle, and spread the mixture along the " V " trough, three times a day. The chickens were kept hungry during the first week. After that they were fed twice a day as much as they would eat. During the last ten days they were fed a small quantity of tallow in the mixture. The tallow was melted and mixed with a small portion of meal. That was readily mixed with the bulk of the food. A pound of tallow per day was allowed to 70 chickens at the beginning of the 10 day feeding time, and by the end of that the quantity was increased to a pound of tallow for 50 chickens per day.

Sometime during the feeding period, in his case just before the killing time, the chickens were taken out and a pinch of sulphur rubbed under a wing and under the tail. That, he said, was a sure means of killing all the vermin on the chickens. I tried that on chickens covered with vermin and did not see a single insect on them after the treatment was applied twice. The sulphur seemed also to give a rather nicer appearance to the skin of the chickens when plucked.

*By Mr. Calvert :*

Q. Did one application of sulphur suffice ?

A. I put it on twice at an interval of about a week.

After feeding the chickens for about a week on the thin mixture three times a day, they were fed for about a week on a thicker mixture twice a day only ; and then they were fed during the last week of the fattening period with what is known as a crammer.

This cramming machine is simply a hopper or reservoir about the shape and size of a large pail, on a stand about four feet from the ground. At the bottom of the hopper is the cylinder of a pump. That may be about three inches in diameter. The piston rod is connected with a lever to be worked by a man's foot. When the foot is pressed down that pumps the stuff out. At the bottom of the cylinder of the pump there is an opening or small nozzle to which is connected a rubber tube about as large as my little finger and about ten inches long. Different sizes of tubes are used for chickens and turkeys. When the cramming process is begun the hopper is filled. A boy hands out a chicken to the operator. He opens the chicken's beak with one hand, then slips the tube down the throat. The tube is moistened with the food, the mixture being an oleaginous one. One stroke of his foot, with his hand across the chicken's breast, gives the chicken its breakfast or its dinner, as the case may be. The point is to give the chicken enough, but not so much as to distend its crop unduly. The foot is lifted up and all pressure is taken

off the pump before the tube is withdrawn from the crop, otherwise there is danger of choking the chicken by spreading the sticky food up its throat and over the windpipe. When any food remains in the crop of the chicken, it should not be fed. It should be allowed to miss one meal until the crop is empty.

An expert chicken man with a boy to help him, and in some cases two boys, will feed from 300 to 350 chickens an hour. It is not a tedious or expensive operation, nor is it an operation that injures the chickens. The average death rate at a large fattening establishment was reported as less than a chicken a week where about 5,000 chickens were kept. At one of our fattening stations in Canada the woman in charge took a sickly chicken and nursed it back to strength in a few days by using the machine. The chicken assimilated the food and derived strength from it. There is nothing cruel or brutal in the practice. The chickens did not squawk or try to get away after the third or fourth time of feeding. They seemed to know what was coming and seemed quite willing to accept the dose.

*By Mr. Rogers :*

Q. Did you try any other mixture ?

A. We tried a mixture of oats, barley, wheat and pease.

Q. No corn ?

A. Indian corn is not used. It makes the fat of the chickens yellow; and the English buyer objects to that. He likes the flesh as white as possible; and feeders find the oats and skim milk the best mixture.

*By Mr. Burnett :*

Q. What is the cost of the machine ?

A. Four pounds, fifteen shillings, in England.

Q. And what in Canada ?

A. We are hoping to get them made in Canada. We imported two. I think they can be made and sold at a profit at \$15 apiece.

*By Mr. Calvert :*

Q. How often are the chickens fed ?

A. Twice a day, morning and night, with the machine.

*By Mr. Rutherford :*

Q. Do they supply them with water ?

A. We found in this country the chickens did better by getting a little water once a day.

I found that the chickens were killed by having their necks wrung. They were not bled and they were not drawn when sent to market. Their necks were broken, wrung in the usual sense of that word. It is done by taking the chicken in the hands, stretching the neck, holding the crown of the head in the hollow of the hand, and giving it a quick turn backwards. It is very easily done.

*By an hon. Member :*

Q. Why do they adopt this method, do they cut off the head ?

A. No, they do not cut off the head. The object of killing them in this manner is to avoid any mutilation of the chicken. The English buyer is very particular upon this point and will not buy a chicken that has had its head cut off. Chickens that are mutilated might possibly have been killed by some animal. When the chickens are killed they are taken and plucked while warm. It is not a very tedious operation when

one is trained to do the plucking properly ; and those employed at this work do it very quickly. A lad told me that each one of the boys would pluck from 12 to 14 chickens per hour.

*By Mr. Burnett :*

Q. That does not include the pin feathers ?

A. They plucked them fairly clean only ; the pin feathers and down are taken off by the poulterers in the shops. It is almost impossible for those who are not trained to do the work quickly. In any trade or business a person's fingers become more nimble and far more skilful with practice. I am not at all accustomed to plucking chickens myself, in fact never tried it before ; but after we had fattened some chickens, I took one chicken and plucked it. It took me a considerable time, but afterwards I found I could do it at the rate of about six an hour ; and I was not at all expert. One of the maids at my house became expert with a little practice, and could pluck sometimes eight an hour. The method they adopt when plucking is to pull the feathers slightly outward and away from the tail end of the bird with a quick jerky motion. I never before actually understood the meaning of the expression "make the feathers fly" until I saw the plucking of chickens. They are plucked clean except a ring around the neck about an inch or an inch and a-half long. Those feathers hide any discoloration at a point where the neck is broken.

*By Mr. Calvert :*

Q. Are all the pin feathers taken off ?

A. No ; and in some cases a few decorative feathers are left at the tips of the wings. When the chickens are plucked they are put on a shaping board. That may be a board about six inches wide, placed against a wall and making with the wall an angle of about 65 degrees. Or it may be a V shaped trough with about that angle. As soon as each chicken is plucked its legs are laid alongside its breast. The stern of the chicken is struck or pushed against the wall and pressed into the angle of the shaping board or trough. Each bird is laid in with its breast downward, a glazed brick or other weight is laid on top, another brick is put alongside to keep it in position until the next bird is pressed closely there. After the row is full, the chickens are left lying on their breasts with a board laid on top of them, with sufficient weight to hold them firmly and crush the breast bones slightly, but not so as to break them. While they are in this position the body is partly drained of the blood which collects in the neck. They are left there to cool, and set, and then they are packed in crates and shipped to market. The squeezing on the setting board gives them a more compact shape.

*By an hon. Member :*

Q. What was the profit upon these chickens ?

A. At the time I was at Mr. Taylor's, he was paying one shilling and nine pence each to the farmers for the chickens for fattening ; and he was selling them as fast as he could get them ready at three shillings and sixpence each, which is 84 cents each in our currency, or twice the price which he paid for them.

*By Mr. Rutherford :*

Q. This board you speak of is set at an angle of 65 degrees sloping away from the wall ?

A. No, it is sloping towards the wall. The angle formed by the board and the wall on the upper side is about 65 degrees, about one-half the body is above the level of the edge of the board and consequently the blood is drained into the neck. While it is being plucked the neck is hanging downwards and the draining of the blood into the neck goes on.



*By Mr. Pettet :*

Q. Do they starve the chickens before killing them ?

A. I found it advisable to do so in this country for about 36 hours, but in England they are not particular to starve them so long as that, because the chickens are sent to the market very quickly after killing. Here we found we should starve them for 36 hours, in order to have the crops quite empty and thus avoid the risk of leaving any food in the crops and intestines which would ferment and spoil the flavour of the birds.

*By Mr. Calvert :*

Q. Then this man doubled his money in about three weeks ?

A. Yes ; but for that he collected, fattened and sold the chickens.

*By Mr. Parmalee :*

Q. What will be about the average weight gained ?

A. They were gaining about two and a half pounds a piece, and selling at from five and a half to six pounds.

*By Mr. Clancy :*

Q. How long were they fed ?

A. When I was there they were feeding about three weeks. There is no profit in feeding more than five weeks. About four weeks seems to be the period in which a chicken will grow best. More than that they will waste, and if you kill them before that you are sacrificing a little.

*By an hon. Member :*

Q. Is this fattening business confined to the south of England ?

A. Almost entirely. It is not spread over England ; and some of the poulterers even in Edinburgh get their chickens from the London market.

#### CHICKEN-FATTENING IN CANADA.

I reported this matter at the time to the Minister of Agriculture, whom I accompanied to England. I reported again to him upon my return to Canada and received authority to start two chicken-fattening stations in order to see whether similar results would be obtained here, and whether chickens fattened here would find a market and bring as good a price as those in England. We had a number of crates made of the same size as those I saw in use in England ; but instead of using small poles of willow or hazel, we made ours of basswood. In order to get the material we took basswood boards one inch thick and had them sawn into strips about an inch by five eighths. These were planed in order that the coops might be the more easily cleansed. The bottoms had no floor except the slats. The droppings fell through on the ground. The crates were about 3½ feet off the ground, and the droppings were received, on soil or sand underneath. We arranged with Mr. and Mrs. Joseph Yuill, of Carleton Place, Ontario, known as good chicken raisers, to carry on this work. At Carleton Place directions were given to Mr. and Mrs. Yuill to buy chickens from the farmers of as good quality as possible, from 3 to 3½ pounds live weight, of breeds likely to fatten well, and having white, or if that were not possible, at least light yellow legs. The English poultry buyers object to black legs. Only about half the price is obtainable for chickens with black legs as compared with those which have white or light yellow legs. A similar fattening station was started at Bondville, Quebec, under the charge of Mr. Hillhouse.

*By Mr. McGregor :*

Q. What time of year was this?

A. In September and October.

At Carleton Place the chickens were bought, costing  $53\frac{3}{4}$  cents a pair. They could have been bought a little cheaper if it had been two months earlier as chickens are available two months after July. These chickens weighed on the average four pounds five ounces each, live weight. They were put up in coops and fattened on ground grain, chiefly oats mixed with skimmed milk. During the last two weeks they received an allowance of tallow.

The crates or coops in which the fattening was carried on were  $6\frac{1}{2}$  feet long by 16 inches square, inside measurement. Each crate was divided into three compartments; and each compartment held four chickens. When the chickens are comparatively small, five may be put in each compartment. The crates were made of slats running lengthwise on three sides—bottom, back and top—and up and down in front. The slats were one inch wide by five-eighths of an inch thick. The spaces between the slats in front should be not less than two inches wide to permit the chickens to put their heads through for feeding from the trough. The slats on the bottom should be put on three-quarters of an inch apart, and the outside slat nearest to each side should be an inch or more from the corner piece. That prevents the corner piece along the inside of the bottom from becoming a ledge to hold the droppings of the chickens. Each compartment has a small sliding door in front.

The crates were placed on stands about  $2\frac{1}{2}$  or 3 feet from the ground. The droppings from the chickens were received on sand or some absorbent material.

A light V trough  $2\frac{1}{2}$  inches inside, was placed in front of each crate, being carried on two brackets nailed to the ends of the crate. The bottom of the trough was about level with the floor slats of the crate.

The grain was ground fine and was mixed with skim-milk, sweet or sour, preferably sour. The hulls of the oats should be pulverized until they are scarcely discernible. The mixture should have about the consistency of thin porridge; so thick that it will not run readily; and so thin that if a large spoonful of it were put on a plate it would spread.

The chickens were fed from the troughs three times a day at first. After the first ten days they should be fed only twice a day. At the end of the second ten days, they may be fed by the use of the cramming machine which has been already described. During the last ten days of the fattening period a small portion of tallow should be put with the feed. At first, at the rate of one pound of tallow per day for about 70 or 100 chickens. The quantity may be gradually increased until one pound per day is given to from 50 to 70 chickens according to size. The best way to mix the tallow is to melt a portion of it, thicken it while still hot with meal, and then mix the right quantity of that paste with the other feed for the day.

The chickens at the fattening stations at Carleton Place, Ontario, and Bondville, Quebec, were fattened in the manner above described.

An important point is to feed regularly; and if any food remains in the crop from a previous meal, not to feed at all until the crop is quite empty. In case a bird becomes sick it should be taken out and put in an open run without food for a day. Grit should be offered to all the birds once a week, and water supplied every day.

The following tables show the results from the chickens which were fattened at Carleton Place.

On 11th October, the 133 chickens weighed 575 pounds.

The following table shows the gain per week :—

1st week ending October 18.....	57 lbs.
2nd   "               "   25.....	74 "
3rd   "               November 1.....	127 "
4th   "               "   8.....	12 "
5th   "               "   15.....	13 "
6th   "               "   22.....	58 "
Total gain.....	<u>341 "</u>

The average gain per chicken was two pounds nine ounces. The chickens began to moult at the end of the third week, and did not thrive well again until the beginning of the sixth week.

The total quantity of feed consumed was :—

Ground oats.....	1,256 lbs.	
"   barley.....	247 "	
"   wheat.....	172 "	
"   pease.....	63 "	
	<u>1,738</u>	" at \$1 per 100 lbs.=\$17.38
Tallow.....	23 "	" at 3c. = 0.69
Skim-milk.....	2,589 "	" at 15c. per 100 lbs.= 3.88
		<u>\$21.95</u>

The cost for feed at those prices was 6.43c. per pound of increase live weight, or practically 6½c. per pound.

The quantity of feed consumed was 5.1 pounds of ground grain plus 7.6 pounds of skim-milk per pound of increase in live weight.

I may mention here that in feeding 48 smaller chickens at a later date at Bondville, the quantities of feed consumed per pound of increase when the chickens were fed from the troughs were greater than when the cramming machine was used.

The following table shows the quantities consumed per pound of increase live weight.

	Ground meal.	Skim-milk.
From trough (3 weeks).....	6.73 lbs. plus	9.38 lbs.
By machine (10 days).....	5.15 "	6.17 "

In all instances the figures do not include anything for labour.

Reverting again to the chickens at Carleton Place, at the end of six weeks they were starved for from 24 to 36 hours and killed by wringing their necks. They were plucked but were not drawn. A ring of feathers about two inches long was left at the head of each bird. They were placed on a shaping board as already described. After being thoroughly cooled each bird was wrapped in a piece of clean brown paper leaving the neck and head to project at one end and the legs at the other.

Shipping cases were made to hold 12 fowls each. The cases were 33 inches long by 19 inches wide by 6½ inches deep. The ends were one inch thick, as also was the centre piece across the middle of the case. The sides, top and bottom were of five-eighth inch spruce. The fowls were sorted into sizes. The largest birds were reserved for exhibition uses in Canada; and 9 cases containing 108 fowls were shipped to James Ruddin, Esq., St. John's Market, Liverpool.

They were sent by express from Carleton Place to St. John, N.B., and thence in cold storage to Liverpool.

The total charges, for freight in cold storage from St. John, N.B., to Liverpool, for selling commission and other expenses such as wharf dues and cartage was 23¼ cents per



pair of chickens. Taking the ordinary freight charges on a less-than-carload lot from Carleton Place, via St. John, to Liverpool, in cold storage, the total transportation and selling charges would amount to about 18 cents per pair of chickens of an equal weight with those sent in the trial shipment. The 108 chickens weighed five pounds more than 11 pounds per pair on the average.

The following table shows the cost with freight on usual basis (not express) of laying down and selling such chickens in Liverpool.

	Per Pair.
Original cost of chickens. . . . .	54 cents.
Cost of feed . . . . .	33 "
Cost of shipping cases.. . . .	3 "
Freight, commission, etc. . . . .	18 "
	<hr/>
	\$1.08 "
	<hr/>

These figures do not include anything for labour of feeding or shipping. The chickens which were consigned to Mr. Ruddin met with a ready sale at eight pence (sixteen cents) per pound. As they weighed 11 pounds per pair, that was equal to \$1.76 per pair. Mr. Ruddin wrote as follows:—

"I was agreeably surprised at the all-round excellence of your small experimental shipment of Canada capons. On opening the cases the birds were found to be in beautiful condition and presented a most saleable appearance.

"After the birds were uncased I hung one to find out how long it would retain its bright appearance, and found that it became milky white in colour as soon as the bird had dried out of the chilled state; to-day, five days later, it is as nice looking as a fresh-killed bird.

"I think the price obtained will both please and pay you. It is a fair market price, and on a par with the present rates for Surrey chickens. For small weekly arrivals, I venture to think the price could be maintained, but anticipate that large consignments would bring the figure down to sevenpence (14 cents) per pound."

These fowls were landed in Liverpool in the second week in December. That is not a particularly favourable time as poultry from all quarters is being received then before the Christmas markets.

Shipment of the fowls from the Bondville, Quebec, fattening station was made to London, England, at the same time. They also were landed in fine condition but they were not sold so well as those in Liverpool. Some of them were sold for three shillings (that is 75 cents) each, and the smaller ones did not do so well. The London shipment was not sold to my satisfaction. Another firm in England cabled to the firm who are the largest shippers of eggs from Ontario, inquiring whether they could ship a large quantity of fattened poultry weekly—of poultry similar to those in our trial shipments. These three firms alone intimated their ability and willingness to handle about 2,000 cases per week at good prices.

*By Mr. Calvert:*

Q. May I ask you one question? In shipping in cold storage, what is the additional cost of transport?

A. Ten shillings per ton additional for cold storage on the steamship, the ton being 70 feet cubic measure or 2,240 pounds weight.

*By Mr. McNeill:*

Q. Was that industry carried on all the year round in England?

A. The whole year round. The scarcity in chickens is from January to June; and the greatest supply from June to the end of December. As to the possibility of having it all the year round in Canada, I may say that we have still something like 40 chickens fattened last fall in cold storage in Ottawa, in the very best condition.

*By Mr. Wilson :*

Q. Does not keeping them cold affect the flavour and the price ?

A. I have been testing them as to flavour and other qualities, and I find them uninjured. In fact they have a method now in England of defrosting frozen beef, and one cannot tell the defrosted from the unfrozen chilled beef.

*By an hon. Member :*

Q. Does the storage not discolour the flesh of the chickens ?

A. Not at all. It is quite white.

*By Mr. Wilson :*

Q. Does not freezing discolour beef ?

A. Beef when taken out of cold storage become discoloured readily on the surface ; but the flesh inside need not be discoloured. The Liverpool merchant said that the flesh of the chickens we sent over was particularly white.

*By Mr. McNeill :*

Q. What is the object of feeding the tallow ?

A. It makes the flesh of the chickens juicy.

*By Mr. Rogers :*

Q. You would think the blood would colour the flesh ?

A. It does not appear to do so. Since there is no cut on the skin of the chicken, either on the neck or for removing the entrails, the chickens will keep a long time without any decomposition. The juices of the flesh are not exposed, and there is no chance of bacteria getting at them. The safe keeping is possible only when the chickens are starved for thirty-six hours, and there is no food in their crops or intestines to decay.

Some turkeys sent over from Ontario last year, starved twenty-four hours and plucked, killed and prepared in the way recommended, were landed in splendid condition ; whereas some turkeys sent from Prince Edward Island, with the feathers on and the crops full of food, were landed in such condition that they had to be cut and sold on hucksters barrows for one shilling and six pence.

*By an hon. Member :*

Q. Are there facilities for regular transportation in cold storage ?

A. There is regular cold storage from St. John and Halifax, and regular cold storage from Montreal till navigation on the St. Lawrence closes.

*By Mr. McLaren :*

Q. Which is the more harmful, leaving the feathers on or the food ?

A. Oh, the food. It causes decomposition. The feathers being left on prevent the birds from being properly cooled, but otherwise they preserve the skin.

*By Mr. McNeill :*

Q. Would extreme hot weather have any deleterious effect upon the process of feeding ?

A. I do not think so, unless it was continued too long.

Q. Would the birds thrive if kept closed up in hot weather ?

A. I think, if they were kept in shaded, well ventilated places, they would do well.

## FATTENED VERSUS LEAN CHICKENS.

One morning I bought in the market in Ottawa 101 chickens just as they were brought there alive to be sold for food. I did not get the best on the market, and I would not take the worst.

*By Mr. McNeill :*

Q. Were they dead ?

A. No, they were all alive.

I had some coops or crates as already described. I put some of them in an open shed ; and I put other coops beside a close board fence outside with a board protection overhead. When I got these chickens home they had cost me 38 cents a pair. I valued ground oats at a dollar per hundred pounds ; and I had skim-milk from a couple of cows. I valued the skim-milk at 20 cents per 100 pounds. I fed them a little over five weeks, exactly 36 days. I did this for my own information and at my own expense. I obtained some information in addition to what was got from the Government stations.

For every pound of increase in live weight they consumed on the average 5.44 pounds of ground oats, plus 6.43 pounds of skim-milk. At \$1 per hundred pounds for the ground oats and 20 cents per hundred pounds for the skim-milk, the cost was nearly six and three-quarter cents per pound of increase in the live weight, for feed only.

*By Mr. McLaren :*

Q. Did you use the crammer here ?

A. I had one brought here in order to give lessons in the use of it, but my own chickens were not fed by the crammer.

When I got these chickens home I killed three average chickens as soon as I could. I selected them as a fair average of the lot. I had them dressed and steamed until they were fairly tender. After being steamed they were put aside, wrapped in napkins for two days. During that time they probably lost a little in weight, but not very much, as they were wrapped up. I then took them and carefully removed all the edible portion. I found that the edible portion on these three chickens weighed 2 pounds 6 ounces. They were a fair average of the 101 chickens which I had bought. After I had fed the other chickens in the way I have mentioned (and mine were not fed by the cramming machine) for a little over five weeks, I again selected three chickens, as nearly the average as I could select them, and killed them. I treated them in precisely the same way as the first lot. After removing the edible portion, I found that I had 7 pounds 6 ounces off the three. That is, I had more cold chicken for the table per chicken from those which had been fattened than I had off the whole three that were killed before being fattened.

The following table shows the difference in the weights of representative chickens killed before being fattened and similar chickens killed after being fattened for 36 days :—

WEIGHT OF THREE CHICKENS.

	Before Fattening.		After Fattening.	
With feathers off.....	8 lbs.	8 ozs.	16 lbs.	4 ozs.
Ready for cooking.....	5 "	2 "	11 "	6 "
After being cooked and left cool two days .....	3 "	8 "	9 "	2 "
Bones.....	1 "	2 "	1 "	11 "
Edible portion.....	2 "	6 "	7 "	6 "



This shows that there were three times more edible portion from the fattened chickens than from the others, and every ounce of it was of better quality.

*By an hon. Member :*

Q. There was a gain in quality too?

A. Yes. A great improvement, any one who has used fattened chickens as I did last winter would never willingly go back to lean chickens.

*By Mr. McNeill :*

Q. What time was it you bought those chickens?

A. I bought them in October and killed them in November. That shows that as a householder in Ottawa it would pay me a great deal better to pay 60 cents for a well fattened chicken than to buy the other ones as they are sold on the market at 20 cents each. I would have better value at 60 cents than I would have at 20 cents; and I am confident that in the market here as well as in England there will be a very large demand for fattened chickens and at a good price per pound.

*By Mr. Calvert :*

Q. It costs some 6½ cents per pound for the increase?

A. About that.

*By Mr. Clancy :*

Q. You have allowed nothing for labour?

A. No, I am taking the cost of the feed only. The labour is an item that is not a very serious one, and the manure is an exceedingly valuable thing for the garden. In many localities in Canada there are farmers who grow thousands of chickens, and who can sell them at three months old. If each such locality had a good chicken fatterer, he would find himself in a profitable business, and could provide a market for all the chickens raised by his neighbours who have not time to fatten them themselves. I think an expert trade can be built up which may be made worth several millions of dollars a year in five years' time, if the business is taken hold of and carefully handled.

*By Mr. McLaren :*

Q. For a man starting in at the present time would he be able to find a market for those he has?

A. I think so, both in Canadian cities and in Great Britain.

*By Mr. Martin :*

Q. What breed of chickens do you prefer to have?

A. In England the breed which is preferred is the Dorking. They are a long breasted heavy bird. We found the Plymouth rocks and grades of Plymouth rocks, Wyandottes and light Brahmas do very well. Any of these heavy bodied fowls do well. I did not find any difference between the fattening qualities of the cockerels and pullets, but in shipping they should be put in separate cases. The more evenly the birds are sorted in each case as to appearance and size, the better they will sell in the English market. An Englishman, in buying, does not like to have an assortment of birds of different sizes and appearances in the one case.

*By Mr. Calvert :*

Q. Do you know why they object to birds with black legs?

A. No, I do not; but they do not want them.

*By Mr. Cargill :*

Q. Supposing a person is going into this line of business and getting chickens ready for the market, where would he find a market for them?

A. It is quite likely that he will find business men in Toronto and Montreal to whom he could sell them for export. There are a few men in Montreal and Toronto who export turkeys and some of them say they will export chickens this year if they can get them. Some firms in England, three at least, have been writing to ask where they can get chickens. There is also a capital local demand growing up for fattened chickens.

I have been authorized to arrange for starting several more of these fattening stations in different parts of the country this year, for the purpose of giving object lessons in different places.

*By Mr. Burnett :*

Q. I want to ask you a question in regard to plucking. Did you allow them to get cold or did you pluck them immediately?

A. Immediately after the necks were wrung, while the chickens were still warm.

*By Mr. McNeill :*

Q. Would you kindly tell me about winter accommodation ; surely something more than mere coops are needed if it is to be continued in winter, or is this only an industry to be carried on in the spring, summer and autumn?

A. I think in this country fattening will be carried on only from July to November, out of doors ; then the chickens will be killed off and stored for domestic use or for export.

Having examined the preceding transcript of my evidence, I find it correct.

JAS. W. ROBERTSON,  
*Commissioner of Agriculture and Dairying.*

## IMPROVEMENTS IN CROP GROWING.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
FRIDAY, 5th May, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 o'clock a.m., Mr. Bain, chairman, presiding.

Mr. JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying, was present by request of the committee, and spoke as follows :—

Mr. Chairman and Gentlemen,—I desire to speak this morning on the fundamental principles that underlie the successful growing of crops in Canada. This is essentially an agricultural country, since 45 per cent of the population are engaged in that industry. About 20 per cent more of the population are engaged directly or indirectly in handling the products of the farms or in making or handling machinery and implements for the farm. A very large proportion of our people depend for their living and for their success in life on agriculture. In the widest sense, national prosperity depends primarily on the production of wealth out of our natural resources. The great fisheries of this country yield annually \$23,000,000; the mines and mining, including coal, \$37,000,000; the forestry and lumber interests, including firewood, as near as they can be estimated, \$80,000,000; the farm crops not less than \$280,000,000, and all farm products, including crops, not less than \$600,000,000. Good times follow the fortunes of the farmers.

## THE DIFFICULTIES OF FARMING.

The difficulties that confront the farmers in Canada, as I see them, are mainly of five sorts; and I believe that if they understand the fundamental principles of growing crops successfully, they will overcome these difficulties successfully in most years. But if they trust to a series of prescriptions or rules to guide their work, they will not make progress in crop growing.

These difficulties I put down as follows :—

(1.) Those that arise out of the growing of crops; (These are becoming greater every year from the partial exhaustion of the soil, from the increasing prevalence of weeds, and from the more vicious and general attacks of insect and fungus pests.)

(2.) Those that come from the necessity of meeting the demands of markets for better qualities in everything;

(3.) Those which grow out of the changed conditions of life, and which require the farmers to carry on more varied, mixed or diversified classes of farming; (These come from the growth of population in cities and towns; from the people becoming better off and more fastidious and exacting in their tastes; and through cold storage giving them an opportunity to market perishable things abroad.)

(4.) Those which have come with low prices for general farm products, and which are beyond the control of the people of this country; and

(5.) Those that are inseparable from maintaining the fertility of soil economically.

Now, although the Government may not have the power to remove difficulties, every one admits that it may and should assist farmers to overcome them. These difficulties increase, and should not be left to the weakness of even the strong individual,



strong though he may be in discernment, in good judgment, in practical ability and farming skill.

Since we have, over large areas of the country, lamentably small crops, considering the character of the soil, which could and should carry large crops, we come to the question,—To what are the small crops due?

They must be due to one of several causes, or to several or all of them combined. The first is either insufficient moisture in the soil or too much. The second is unfavourable temperature in the soil and over the soil. The next is unsuitable physical conditions for the roots of plants in the soil. The fourth is the want of available plant food for the crops that are growing. The fifth is the lack of inherited or other powers in the plants themselves. The first two—moisture and temperature—belong to the climate, and are in a measure, but not wholly, beyond the control of the farmers. The third—the physical condition of the soil—is nearly altogether under the control of the farmers, because that depends on cultivation, including drainage. The fourth—the want of available plant food for crops that are growing—may be corrected by management, the rotation of crops and the application of farmyard manure. The fifth—the lack of inherited or other power in the plants—can be remedied by selection of the seed that is sown on the fields.

In brief, (1) the ease or difficulty with which plants may secure their food out of the soil and air, and (2) the power of the plants to take their food out of the soil and air, are the two big things in the consideration of growing crops. The climatic conditions of the season, and the ability and intelligence of the farmers, as applied to the growing of crops, are what affect these most; and through these, determine whether the crops shall be large or small.

I believe that if the farmers can be got to understand clearly a few fundamental principles, and know the underlying reasons for the common things they do, they will do these far better.

#### TO CONTROL MOISTURE AND TEMPERATURE.

That brings me to speak for a little of the effect on crops of controllable climate. In ordinary seasons the moisture in the soil, available to growing plants, depends almost entirely on the amount of what is called humus or decaying plant material which the soil contains. An abundance of that, with good cultivation and drainage, will regulate the moisture, and permit the air to have access to the roots. The burying in the soil of some form of decaying plant substance is one of the wisest ways of controlling the soil moisture and of influencing the soil temperature favourably. Farmyard manure and green crops which may be ploughed under, should be kept as near the surface as is practicable. Plenty of humus from decaying vegetable matter in the soil, and such cultivation as will keep the surface loose and friable, will regulate the moisture in a large measure. You see I am not going far into details of methods on this part of the subject, because I verily believe that if the farmers are taught principles they will apply them by methods suited to their circumstances and farm conditions.

The next point is temperature—controllable temperature in the soil. Heavy soils are often wet soils, particularly in the spring. From want of drainage, want of deep grown roots, they are so compact that they hold water. When that evaporates rapidly, it cools the soil and sometimes bakes it. Rapid evaporation removes the moisture but makes the land cold. You know that when seed is put in, in springtime, it is most important that the temperature should be favourable to a quick germination of the seed. Every one knows that the seeds which germinate most rapidly give the most vigorous plants. If you have a delayed, if you have a difficult germination, you have a relatively weak stand of plants. Quick, active germination after sowing is most important towards getting a crop well grown afterwards. Take the matter of rolling alone. Comparing rolled land with land not rolled after the seeds were in, on an average of eight farms, in the springtime, in clear weather, the rolled land had a temperature over three degrees (3.12) higher at a depth of an inch and a half from the surface, than the unrolled land alongside; and at a depth of three inches down it had a temperature of nearly three degrees (2.92) higher than the unrolled. The rolled land was three degrees warmer

than the unrolled land lying alongside. The lumpy irregular surface of the unrolled land radiated the heat from the rays of the sun into the air ; the rolled land retained more of it in the soil. That might make the difference between the quick starting of a crop and the delayed germination and consequent weakening of the crop. These figures are given by King, and are the average for eight farms in Wisconsin ; these farms were of different kinds of soil, clay, gravel and loam ; and the temperatures were taken between one and four o'clock in the day.

#### SURFACE CULTIVATION.

The third point is that of cultivation. I have only a few words to say on that. Cultivation is not only to make a suitable seed-bed for the root-hold of the plants ; it is to kill weeds which are the great thieves of plant food and mainly the thieves of the water, which they evaporate into the atmosphere. Surface cultivation keeps the moisture near the roots of the plants. Experiments at the Experiment Station in Michigan show that frequent cultivation between rows of Indian corn made a difference of 86 per cent in the yield over the uncultivated. Frequent cultivation gave an increase of 17 per cent over partial infrequent cultivation. Surface cultivation makes a loose mulch of soil which arrests the capillary movement of the water from beneath ; and leaves it available to the roots. For nearly all the crops, the ideal method of surface cultivation is to roll the land after they are put in (that makes the soil warmer) and then immediately before the plants are up or after they are a few inches high, to harrow it lightly to make a surface mulch (that makes the soil moisture available and prevents drying and cooling the soil by rapid evaporation until it is shaded by the crop). All matter taken up by the roots of the plants is taken in solution. It has been estimated that for every ton of dry matter which a crop contains it has thrown off through its leaves not less than 300 tons of water in its growing. Then there is the solvent action of juice from the roots of the plants. Exudations from the roots touch mineral matters and dissolving them make them available for the rootlets to take up.

A plant is an organism composed of some thirteen substances obtained from air, water and soil. These are acted upon by the energy of life in the plant and the energy of the sun. Cultivation is also to allow the air to penetrate the soil and to deposit dew while warming the soil. Dew does not refresh so much by getting on the leaves of the plants, as by distilling itself into the porous soil through which it reaches the roots. Farm crops as far as we know do not take in any moisture through their leaves. Through its penetration and the depositing of dew, the air warms and moistens the soil. Then the acid juices from the tiny rootlets corrode mineral matters and make them available. I have put a nail in soil for three days and then rubbed off some of it with my finger. The corroding action of the juices of vegetable matter, makes the rust ; and you can rub that off and put it in water and taste it. It is a question of making things available as plant food, that are otherwise unavailable.

#### CANADIAN SOILS ARE RICH.

In most of the soil of Canada to the depth of one foot, there is plenty of the elements of plant food ; but they are not always in available form. The averages of some analyses, by Mr. Shutt, of the Central Experimental Farm, of soils in Canada, give the following results :—In the top foot there are 7,700 pounds of nitrogen per acre. If that is in available form there is enough for over 150 very large crops of cereals. There is on the average in the same depth, 5,400 pounds of phosphoric acid. That, if all available, would be sufficient for not less than 250 large crops of cereals, without putting any back into the soil. Of potash there are 11,700 pounds in the top foot of soil, which is enough for 300 crops of cereals of large yield, without putting anything back. These things, however, are not always in available form ; and a plant may starve even in the

midst of plenty, if they are not available. When the quantity falls below a certain percentage, the soil is practically barren and yields no return for the labour put upon it.

#### THE VALUE OF CLOVER CROPS.

One means of increasing the amount of nitrogen in the soil, and of making some of the nitrogen already there available for grain crops, is by the growing of clover and similar plants that have the power of taking some nitrogen from the air and organizing it into such forms that a succeeding crop may use it. A crop of clover contains a large quantity of nitrogen in itself, nearly twice as much as an equal weight of hay without clover. When a crop of clover is removed from the land it takes off about 50 pounds of nitrogen per ton of dry clover. At the same time it leaves the soil richer in available nitrogen than does a grain crop which has taken off the land less than one-quarter as much nitrogen. It is further found that the above-ground and under-ground stubble and root parts of a clover crop, leave in the land a greater quantity of vegetable residue than any cereal crop; and the whole quantity so left is richer in nitrogen. Most valuable information on this point is furnished by the experiments at Rothamsted, England, which were reported on for a period of 32 years (1852 to 1883). I submit one striking instance of the effect upon a crop of barley of the growing of clover on the same land the preceding year.

A field had grown one crop of wheat, one of oats, and three of barley in succession, with artificial and nitrogenous manures, but without any farmyard or other organic manure. The following year (1872) barley was again sown; that was the fourth crop of barley in succession. On one-half the field the barley was sown alone; on the other half it was sown with clover. The next year (1873) barley was again sown on the one-half; but the clover only was grown on the other half. The following table shows the quantity of nitrogen per acre removed in the crops:

	Nitrogen per acre ; pounds.
1873, Barley.....	37·3
Clover.....	151·3

In the succeeding year (1874) barley was grown over both portions of the field. It is to be observed that the clover crop of 1873 had removed four times more nitrogen per acre than the barley crop of that year; but the barley crop of 1874, yielded 77 per cent more on the portion of the field where it followed clover than it did on the portion where it followed barley. This agrees with what is well known in agriculture that the growth of clover increases the produce of a succeeding cereal crop as much as if a liberal dressing of manure had been applied.

Clover provides excellent fodder for cattle, horses and sheep, and by far the largest part of its nitrogen may be left on the farm in farmyard manure. I think the part of it that can be used for feeding live stock should not be ploughed under until they have taken their toll of it in that way. As far back as the beginning of the Christian era, it was distinctly recognized by the Romans that leguminous crops were not only valuable as food for animals; but that their growth enriched the soil for succeeding crops, in fact were of value as restorative crops grown in alternation (by turns) with cereals.

The following table shows the results of some investigations by Mr. F. T. Shutt, Chemist, Dominion Experimental Farms, on the manurial value of clover, and the weight of nitrogen per acre which the crops had collected into their stems, leaves and roots.



## NITROGEN PER ACRE IN CLOVER CROPS.

No.	Kind.	Sown.	Collected.	Weight of Material (fresh) per acre.			Weight of Nitrogen per acre.		
				Stems and Leaves.	Roots.	Total.	Stems and Leaves.	Roots.	Total.
				Tons. Lbs.	Tons. Lbs.	Tons. Lbs.	Lbs.	Lbs.	Lbs.
1	Mammoth Red...	April, 1894	May, 1895	10 70	5 1,476	15 1,548	101	49	150
2	" " ...	" 1893	" 1895	5 1,235	9 535	14 1,770	50	61	111
3	Mammoth Red...	July, 1896	Oct., 1896	6 1,310	3 1,260	10 570	82	48	130
4	Common Red....	" 1896	" 1896	4 1,779	2 1,445	7 1,224	70	47	117
5	Mammoth Red...	May, 1896	May, 1897	.....	.....	2 1,995	.....	.....	81
6	Common Red....	" 1896	" 1897	.....	.....	3 125	.....	.....	62
7	Mammoth Red...	May, 1897	Oct., 1897	4 508	2 1,785	7 293	62	35	97
8	Common Red....	" 1897	" 1897	5 209	3 296	8 505	76	54	130

Nos. 1 and 2.—Roots taken to a depth of four feet. Good spring growth when sample collected.

Nos. 3 and 4.—Sown in orchard as "cover" crops. Roots taken to depth of two feet.

Nos. 5 and 6.—Winter-killed. Sample collected consisted of dead stems, leaves and roots.

Nos. 7 and 8.—Nitrogen estimated not determined.

It shows that when clover was sown in April of one year and the whole produce was collected in May of the following year to a depth of four feet, the stems, leaves and roots of the clover crop contained 150 pounds of nitrogen per acre. It does not follow that all of that was collected from the atmosphere. Doubtless a good deal of it was got from the soil; but the clover plant does take some of its nitrogen from the atmosphere. It appears to bring the nitrogen into combination under the influence of or by the action of micro-organisms within nodules on the roots of the plants. Clover has not only a long period of growth each year, but it has an uncommonly extended range of root in the soil and subsoil. That gives it great capacity for collection and also for loosening and enriching the land where it is grown. It would take 10 tons to the acre of farm-yard manure of average good quality to put on as much nitrogen as was contained in the stems and roots of that one-year-old clover crop. Ten tons to the acre would not supply any more nitrogen than was found in the clover. While it was not all got from the atmosphere, a large portion of it doubtless was taken from that source. The remainder which was taken up from the soil was left in such forms as to become readily available to succeeding crops.

## BACTERIA ON SOY BEANS.

Then there is nitrification in the soil by other forms of bacterial life. One instance I will mention. Several years ago I went down to Massachusetts to attend a large convention of farmers. Professor Brooks who had spent several years in Japan exhibited specimens of Soy bean plant which were nearly four feet high. He reported that there was an abundant crop of the plants in Massachusetts. The roots of the plants were covered with little nodules or warts. Some one from the neighbouring state of Connecticut said that they had sown seed of Soy beans and reported that they had met with comparative failure. The roots of the bean plants which grew in Connecticut did not have any nodules or warts on them. Examination of the roots of the bean plants grown in Massachusetts showed that bacteria inhabited the nodules on the roots, and evidently by their life and the formation of the nodules, nitrogen had been captured from the air whence it was absorbed by the plants. The following year some bags of the soil were taken from the field in Massachusetts and sown on the Connecticut field. Thereafter a splendid crop of Soy beans was got. Thus a field which the year before was almost

barren so far as the Soy bean was concerned, was made to give a very good crop by spreading these bacteria on it. Low and minute forms of life in the soil are the best agents for maintaining and increasing fertility. They need warmth, moisture and air. Cultivation is a first necessity to them also.

#### WHAT MAKES CROPS RUN TO STRAW.

It is very important that the nitrogen should be available at the right time and not at the wrong time to the growing crop. If the nitrogen in the field becomes soluble and available as late say, as July in Canada, it promotes the growth of the roots, stalks and leaves when the energy of the plants, if for grain crop, should be directed towards making seeds. The time when nitrogen should be available, and is worth most to cereal crops, is when the plants are young and getting their growth.

By the availability of nitrogen the growth of the roots, stems and leaves is greatly promoted and the formation of the buds and flowers and seeds is slightly retarded. Everybody knows that if you have land particularly rich with farmyard manure, or other decaying vegetable material, in a wet season, the crops of grain do not ripen readily but keep on growing straw at the wrong time. That, in my opinion, was the main cause of the failure in the crops of wheat in the maritime provinces last year. The application of farmyard manure in the spring followed by a wet season had a tendency to make the straw grow too late and prevented the heads from filling with seeds.

The leaves of plants are like mouths and stomachs through which they take in carbonic acid gas from the air and build it into carbohydrates, such as starch, sugar and cellulose. Starch forms a very large proportion of all the farm crops grown for food, and therefore it is most important that plants should have vigorous leaves in a healthy condition, to take in the substances out of which starch is formed.

#### MINERAL FERTILIZERS.

Potash is necessary to the formation of starch in the leaves, and then to the transference of it from the leaves to the place where it is to be deposited. That is why, as far as I know, an application of potash is especially valuable in the case of a potato crop, the dry matter of the potato being mostly starch. Certainly when the leaves are damaged or eaten off by insects, before the crop is ripe, the feeding, the growing and producing capacity of the crop is proportionately reduced.

Indirect fertilizers, such as gypsum, lime and common salt do not in themselves furnish plant food that is needed. Indeed they are remarkably like stimulants. They change unavailable forms of plant food in the soil into available forms, and so help the crop in many cases.

Gypsum aids in the process of the nitrification of soil. It acts on the insoluble forms of potash and makes them available for the plants. It is of special value on such crops as clover, pease and lucerne.

Lime, which is not a fertilizer, except of an indirect sort, loosens clay soils, and gives compactness of body to loose, light soils.

Quicklime decomposes vegetable matter, and the application of lime to a newly cleared farm or field will usually give excellent results. It acts also on potash and converts its insoluble forms into soluble forms.

Salt is also in some way an indirect fertilizer, and changes unavailable forms of plant food, chiefly potash, into available forms.

Phosphoric acid assists plants to assimilate other ingredients of their food, helps to hasten the maturing of the plants, and has, in plant growth, the function of helping to transfer the nitrogen into the seeds. That is what ripening is in a large measure, the transference of compounds from the roots, leaves and stalks, into the seeds. Phosphoric acid has evidently an important part to play in doing that.

#### THE ROTATION OF CROPS.

The productiveness of the soil depends upon the substances present in the soil, and still more on the condition of the substances as to availability. That is where and how

the rotation of crops comes in, and can be of very great benefit to the farmer who understands the underlying principle, or at least follows the practice. Some crops by growing on land not merely give a good return in themselves, but they make available in the soil, the plant-food that the succeeding or some succeeding crop needs and can get in better form through their action.

It is admitted that the rotation of crops has been the chief means of improving the agriculture of Great Britain and some other parts of Europe during the century. The practice itself consists in growing roots (or some other cultivated green crop), and leguminous crops (such as clover, beans or pease), or grass (or hay crops), alternately with cereal crops ripened for grain. The famous four-course Norfolk rotation was roots, barley, clover or beans and wheat. The chief point seems to be to make those crops follow each other which have different requirements, as to the time of the season when they benefit most by plenty of available plant-food in the soil and different habits of growth in other respects, particularly in the ranges of their roots. The rotation for any farm must have regard to the soil, the climate, the markets for rotation crops, and other local conditions. Not only the increase in the yield of crops has to be taken into account, but also the value and uses to which the crops can be put when grown. It is for every one to determine what crops he can raise and sell at a profit, and then to plan a rotation to give each of those crops the best possible chance to yield largely.

THE ROTHAMSTED EXPERIMENTS.

At the Rothamsted Experiment Station (England), which I have already referred to, and which I think is the foremost in the world for thoroughness, reliability and comprehensiveness of work with farm crops, a series of experiments were begun in 1848, and have been carried on continuously since that time, to discover the results from growing crops on the same land continuously without and with manure, and from growing similar crops in rotation without and with manure. The rotation was the four-course one of turnips, barley, clover (or beans) or fallow, and wheat. Without going into the details of the experiments and the records as published, I desire to present the following table which I have arranged from the reports of eight courses, thirty-two years (1852-1883). The results from the continuously-grown crops relate to the produce of the same eight seasons as those in which the rotation crops were obtained. The unmanured and superphosphate conditions were the same in both cases. In the case of the mixed manure results, it is to be observed that in the rotation experiments, a quantity of manure was applied for the turnip crops only, which was to carry the whole of the crops of the four-years' course; whilst in the continuous-crop experiments, the quantity of nitrogen which was supplied each year amounted to rather more than one-fourth of that applied for four years in the rotation experiments.

ROTATION *versus* CONTINUOUS.

Average quantities of dry matter per acre in wheat and barley grown in rotation, compared with those grown continuously.

	Unmanured and Superphosphate only.		Mixed Manure.	
	Grain.	Straw.	Grain.	Straw.
	Lbs.	Lbs.	Lbs.	Lbs.
Wheat, rotation.....	1,515	2,585	1,694	3,188
Wheat, continuous.....	706	1,143	1,238	2,142
Percentage increase.....	114	126	36	48
Barley, rotation.....	1,452	1,549	2,109	2,368
Barley, continuous.....	1,001	1,000	2,298	2,489
Percentage increase.....	45	55		
“ decrease.....			8	5



I shall present also the results from an experiment conducted at the Purdue University Experiment Station, Indiana. The object of the experiment was to ascertain the effects on soil and crops of different systems of cropping without the addition of manures or fertilizers. One series of plots was devoted to *continuous* grain growing, the *same* crop being grown every year on one part of the series, and *two* grain crops alternating with each other on another part. On another series of plots three different *rotations* were followed, each one of which included wheat. The following table shows the average yields per acre in bushels for the seven years 1887 to 1893 :

	Bushels per acre.
Wheat, rotation.....	21.61
Wheat, grain only.....	15.89
Increase .....	5.72

This shows that wheat grown in *rotation* with other grain and grass crops has yielded 36 per cent more on an average, than when grown *continuously* on the same soil or in *alternation* with another grain crop.

#### SUMMARY OF BENEFITS.

The great increase in crops grown in rotation over those grown continuously, seems to be because more nitrogen is available to the former ; and perhaps because it is available during the early period of their growth, from the preparation of it by the preceding crop or by the cultivation of that crop. Other benefits from systematic rotation of crops are (1) the distribution of the mechanical operations of the farm over the season ; (2) the opportunity for cleaning the land ; (3) the comparative freedom from damage by insects ; and (4) the production of a variety of products for feeding to live stock and for sale.

#### THE TWO PROCESSES OF INCREASE.

In the growth of all plants that form farm crops there seem to be two processes that govern the increase ; and the understanding of the principles of these will, I think, help any farmer and every farmer to form rotations for himself that will be exceedingly valuable ; whilst without an understanding of these principles he will be always groping in the dark after the best methods. In the growth of plants one set of conditions make for increase in the size of the roots and the stems and the leaves. These are the vegetative part—the part of a plant that perishes utterly when the plant dies. There is another part of the plant that does not perish when the growth ends, viz., the seed that carries the life over to the next crop. The conditions which make for the enlargement of the roots and the stems and the leaves, do not make for increased production of seeds. That is to say, the conditions most favourable to the vegetative processes of the plant are not favourable to the maturing processes, but are almost the opposite. If you will allow me a parenthesis : The understanding of that principle, with the selection of seeds, will do more to improve farming in Canada than anything else I know of in regard to agriculture. The set of conditions favourable for continued increase in size of root and size of stem and size of leaf do not make for increase in the quantity of seeds, but rather for the opposite. The extension of the vegetative stages of development—the formation of roots, stems and leaves—is at the expense of the development of the reproductive parts—the seeds. Take the instance of a bunch of oats growing in a dung-hill ; what happens ? A very large root, a grossly large stem, broad long leaves, and very, very, very few seeds in the head. That is to say, the conditions that make for the continued enlargement of the root, the increase of the stem, and extension of the leaf do not make for an increase in number and weight of the seeds. That is an extreme case, but it reveals a principle. Now, take another set of extreme conditions, where a plant can grow only with difficulty, either in root or stem or leaf. Look on a bare roadside, where a small grass plant tries to form seeds when only three or four

inches high ; then count the percentage of weight of the whole plant made up of the seeds ; and you have a revelation on the other side. The conditions that make it difficult for a plant to grow a larger root and a larger stem and larger leaves after the time of ripening has come, make for the increase of the number of seeds and the increase of the proportion of weight they bear to that of the whole plant. Of course, the conditions that make for the increase of size of root and size of stalk and size of leaf up to a certain point, also make for the increase of seeds ; because the seeds are formed out of what the plant takes in, through its leaves and roots. But when there is an excess of available plant food in the soil, only late in the growing and maturing period of the plant, that may prevent seeds from forming plentifully and ripening thoroughly. That is what happens frequently when farmyard manure is ploughed in, in the spring, for a grain crop in Canada.

In some plants the farmer wants a large root and large stem and large leaf ; and in others he wants only the seeds—the other parts being an unimportant and secondary consideration. An abundance of plant food, an excess of it if you will, early in the life of the plant, makes for the growth of roots and stem and leaves ; and then after the plant is about full size, some difficulty in getting more of it, makes for the growth of seeds. If a man wants large turnips let him pile on the manure. You never saw too much manure on a turnip field, for the size of the turnips. That is quite unlike the bunch of oats on the dung hill. Then you never saw a hay field over manured, so far as the growth was concerned. In the hay you want the stem and leaf ; and in the turnip and mangel and carrot you want the root ; therefore, manuring is the right thing for them. Besides their period of growth and accumulation extends many weeks after the period of collection by ripening cereals has ended ; and that at a time when the farmyard manure applied that season is most readily available ; and when nitrification in the soil is most active.

There is a fundamental principle to guide in making a rotation of crops,—apply manure only for green crops and hay ; and follow these by cereals sown in soil having a very fine tilth, since for them there is only a short growing season. That the early very part of it should be favourable is most important for the yield of grain.

Application of farmyard manure directly for grain crops is almost always a wasteful practice ; but put on for root or other green crops it puts and leaves the soil in the best condition for grain crops to follow. I do not contend for sowing grain on poor land, but for putting manure on for green crops and for grass and for hay, which take all the nourishment they require ; and leave enough, and that in the best condition, for the growth of the succeeding crop of grain.

*By Mr. Featherston :*

Q. Does that apply to Indian corn ?

A. Yes, you want the large stalk and leaf in Indian corn as in hay.

#### SEED GRAIN.

There is another matter that I wish to lay before the Committee this morning. I have spoken of the availability of plant food in the soil, and the making of it more so by cultivation and a rotation of crops. I want to speak also of the power of the plant to take these things out of the soil and the air—the inherited power of the plant. A plant has inherited its initial vital power from all the crops through which it came—all the ancestors through which it ascended or descended. An appreciation of the inherited as well as the acquired power of plants will be of assistance in selecting the kind of seed that will do best on each farmer's land. The matter of vitality of seeds I will not discuss at all this morning. I am not discussing at all the purity or cleanness of seeds, and shall only mention in passing the question of the vitality of seeds. What I want to make clear is the difference in the vigour of growth between seeds of the same variety when sown in different localities, and the difference—the amazing difference—in the productiveness of selected large plump seeds over small seeds of the same variety.

The seed of a cereal is a plant in embryo, and a store of food for the nourishment of the young plant after it wakens into activity (germinates), and until it takes in food through its rootlets and leaves. The germination of the seed is not the so-called creation of life. That happened when the plant was fertilized; and the seed is an embryo, with a store of food lying close by it and within the same skin. The store of food which composes the greater part of the seed is for the maintenance of the young plant until it is able to take enough nourishment through its leaves and rootlets. A young plant is wakened up as soon as the moisture and warmth are sufficient, and its food close by is prepared under the same conditions.

Sometimes an embryo plant is imperfectly formed and weak; and tests show that imperfectly ripened seeds, under ordinary conditions, do not give nearly as good a crop as fully ripened seeds in each of which both the embryo and its food have been fully prepared. Those seeds which germinate most quickly are the best, and it has been proven over and over again that heavy seeds give larger and better crops than small seeds of the same sort. This has been proven over and over again. The reason seems to be that in one case (large seeds), the supply of food for the young plant is plentiful when it most needs it, while in the other case (small seeds), the food supply may be insufficient to nourish the young plant adequately at the most critical time when it is tender and struggling for survival. Under the most favourable conditions of temperature, moisture and food supply in the soil, small seeds might give as much in crop as large seeds. On comparatively poor land, in unfavourable seasons, is where the small seeds give their worst returns. The farmer who has rich soil in a fine condition of tilth is the only one who can afford to sow small seeds, and the risk of comparatively small crops is great even then.

#### THE TENDENCY TO VARIATION.

Every plant that grows has in itself a tendency towards variation. I do not know of a plant that is exactly like any other plant that ever grew or is growing now. I have looked over a lot of peas, and cannot find two that are exactly alike.

*By Mr. McMillan:*

Q. Do you know of any two objects in nature that are exactly alike?

A. No, not any form of life. What I want to say is that there is no real stability or exact continuity in the forms of plant life. Endless variation is the rule; endless variation even within named varieties.

When plants are grown under a set of conditions that are not changed much from year to year they get more into a state of equilibrium than if they, or the crop from their seeds, are grown one year under one set of conditions and another year under another set of conditions. They continue more like what they have been, when they are grown year after year under one set of conditions than if those conditions are changed. If the conditions are changed greatly, from those to which the plants have been accustomed, that change brings out and intensifies the tendency towards variation. Thus every plant that grows will make a strenuous effort to adjust itself to its surroundings so as to make its development and continuation possible; and in so far as it adjusts itself to those surroundings so far does it succeed and no farther. That process of adaptation never stops. Life is a ceaseless struggle, a constant effort to fit in.

#### SOME CAUSES OF VARIATIONS.

If you bring about a change in the life of the plant itself such as by cross-breeding, you intensify the tendency to variation so that it will vary much more than in the line of direct descent; a similar result follows when the conditions under which it is grown are greatly changed. Let me make an illustration. If you take a man who has lived in one part of the globe, living in a modest and uneventful way, and put him over in another part of the globe where life is under an entirely new and different set of conditions to those to which he has been accustomed, in a year or two he becomes an entirely



different man in regard to his ability and activity. He has been lifted out of the conditions under which he has existed and to which he had adjusted himself; and after the change, if he follows the fundamental law of nature he will adjust himself to the new conditions and succeed. That is one reason why we have in Canada the right kind and type of capable people. They have adapted themselves to their surroundings; and adjusted and are still adjusting their surroundings and conditions for their own betterment.

A change of food supply will also bring about a difference in the plants. Starvation as against abundance of food alters the plants.

Then you bring about a difference—a stronger tendency to variation—by the “crossing” of seeds of plants. It is only a chance whether the product will be as good or better than either of the parent seeds. In the most strict sense, perhaps nothing happens altogether by chance, but when there is impossibility of discerning cause and continuity we say it is haphazard or chance. When plants resulting from “the cross” are found to vary in the desired direction, then continued selection of the seeds from those, and again and again of the seeds from those, may develop a valuable and productive strain of seed.

#### STRIKING RESULT OF SELECTION.

On the Experimental Farm in 1892, “a cross” was made between the *Mummy* pea and the *Black-eyed Marrowfat* pea. Those are the samples of the two varieties. The crop from “the cross” was grown in 1893, 1894 and 1895. The pea was “a cross” and carried in itself, like every other plant, a tendency towards variation greatly intensified by the cross-breeding.

Before the crop was sown in 1896, the large pease were selected and sown separately and the small pease were also selected and sown. The crop was harvested and selections of large pease from the product of large pease, and selections of small pease from the product of small pease were made before the crop of 1897 was sown. The large pease were sown by themselves and the small pease by themselves on similar land practically side by side. A similar selection was made before sowing in 1898. Those (showing samples in bottles) are samples of the crops of 1898. The pease which are the product of the large pease are nearly twice as large as those from the small pease. These (the produce of the small pease) weighed 270 grains to the 100 pease and those (the produce of the large pease) weighed 538 grains to the 100 pease. Three years' selection in the size of the pease sown, made that difference in the average of the crops of 1898.

*By Mr. Bell (Addington):*

Q. Were the conditions the same in both cases?

A. Both crops were grown side by side annually in the same soil upon the same farm.

#### A CHANGE OF SEED.

What I want to say now is this, that so far as I can learn, and I will give you abundant proof in a moment, the sowing of seed in a new locality, a locality new to the seed, brings out the tendency to variation, evidently by the plant trying to adjust itself to the new conditions. If it succeeds in that effort, it becomes a suitable plant and suitable variety or strain for that locality. I have heard a great deal about the advantages of a change of seed; but indiscriminate change of seed is a dangerous practice; and the theory that seeds necessarily run out and require to be changed from locality to locality is misleading.

Selection of seed from the best quality and most productive variety or strain in the locality, as seed for that locality, is the right plan and practice.

Now, I want to give some evidence.

I spoke of the effect of a change of conditions,—the effect in producing variations. That is admitted everywhere—everybody knows it. Since that is so, how can the varia-

tion be controlled into a direction that will leave the most profit for the farmer? That is the point. The selection of seeds from plants which have adapted themselves to the conditions in which they are to grow, will give a crop which becomes superior, and better able to adapt itself fully to the conditions of that place, the longer the selection is continued from year to year. A selection of seed from heavy-yielding crops year after year in the same locality, will yield larger crops than by any other method or practice known in the handling of seeds.

I have not said nor do I believe that you can by selection cause plants to vary much in certain respects. The trouble has been that the methods for improvement in crossing, and breeding, and growing flowers and shrubs, have been applied to grains for farm crops; and this has been mischievous in retarding a proper selection of seeds for farm crops all over this continent.

#### THE CHARACTERISTICS OF VARIETIES.

Plants will vary in endless ways; there are variations within named-varieties as well as between varieties. Some of the distinguishing characteristics of varieties are in their form (shape and size); their colour; their habit of growth; their hardiness; the length of their growing period; and their productiveness. If a plant or variety once gets a reasonable measure of fixity in regard to shape of seeds, these qualities are not easily modified or varied. Plants will vary and sport in regard to colour, but if you get that quality once fixed in a variety it will not vary much by change of locality or those other conditions I have spoken of. Black oats will lose their colour gradually, a little under certain conditions, but not easily. You see the point? The qualities of form and colour do not vary easily by change of locality, change of food, or change of climate. The habit of growth does not vary readily or greatly. For instance, a branching variety of oats will continue that habit of growth, and a mane or side-growing variety of oats will keep its distinctive habit of growth all over the Dominion. The habit of growth does not vary readily; a branching variety of oats does not become a mane variety of oats. The comparative growing period of the variety will not vary quickly.

On the other hand the productiveness of the plant and of the variety, which is the quality we are after as farmers, will vary greatly on the least provocation by a change of seed, which ordinarily means a change of locality.

The productive variety of good quality is what we are after. Who cares whether the variety of oats be white or black, if it gives twenty bushels more to the acre and has a big kernel inside? The only means known to insure productiveness in a variety is by continuously selecting seeds from plants that have shown themselves productive in that locality.

Now for the evidence of that. If any variety as such, has a quality of constant superiority in regard to productiveness, then it would have that superiority in all localities where it would grow. I would like to make that as clear as I can. If there is a quality in a variety that leads it to be more productive than others under all ordinary conditions of growth in different localities, then superior productiveness would continue to characterize it over a wide area under different conditions. The form, colour, habit of growth, and hardiness are qualities which are fairly constant in a variety of grain in different localities; but there is a great deal of evidence to show that productiveness is not; and productiveness is what we are after.

#### VARIETIES OF GRAIN ON DOMINION EXPERIMENTAL FARMS.

Take first Bulletin No. 32 of the Central Experimental Farm, which reports on the results obtained in 1898 from trial plots of grain, by Dr. Saunders, director. I use this evidence because, as we all know, the records are kept carefully and correctly; and what is stated in this Bulletin is reliable. I find there were grown on the Central Experimental Farm last year and on three of the four branch farms of which the committee are aware—one in Manitoba, one in the North-west Territories, and one in British Columbia, four widely different localities—there were grown on these farms, for com-

parison as to productiveness, 47 varieties of pease. The twelve varieties of pease that gave the largest crop on each farm were put in lists by themselves. Now if the quality of superior productiveness were inherent in a variety, in different localities and under different conditions, you would expect that in the lists of the twelve most productive at each place, viz., at Ottawa, Brandon, Indian Head and Agassiz, there would be only a few more than twelve. Instead of that, out of 47 varieties tested there were no less than 32 varieties included in the lists of the twelve best varieties at each of the four farms.

#### IS IT MORE THAN CHANCE ?

Now, I believe if you put the thing to a trial by hazard you would get about the same proportion in lists of twelve each. The hazard is whether the seed of a variety new to a locality will adapt itself to the conditions of that locality. At any rate if superior productiveness is constant in a variety as such, there would be evidence that the varieties most productive at one place, even if not in all the lists of twelve best, would be among those above the average at every place. The facts are, as shown by the Experimental Farms Report, 1898, that the variety of pease, *Arthur*, (46 bushels per acre) which was **highest at Ottawa** was the **second lowest** (28 bushels per acre) of all the varieties at Indian Head, N.W.T.; and the variety *White Wonder* (20 bushels per acre) which was **the lowest** in yield of all the varieties compared at Ottawa was **second highest** at Agassiz, B.C., (39 bushels per acre.)

The variety *Harrison's Glory* (59 bushels per acre) which **headed the list** for productiveness at Brandon, Man., gave **the lowest yield** of all the varieties tested at Agassiz, B.C., (22 bushels per acre); and the variety, *Creeper*, (23 bushels per acre) which was at **the very foot of the list** of all the varieties tested at Brandon, Man., was included in the list of **the twelve highest** at Indian Head, N.W.T., (43 bushels per acre.) These are only instances, and the evidence of the whole of the lists is in the same direction.

It is the most convincing evidence I find anywhere that the variety, in regard to productiveness, varies with the locality where it is grown, or varies in degree as it happens to hit the conditions of the locality, or as it adapts itself to them. Could anything be more convincing ?

#### PRODUCTIVENESS NOT CONSTANT IN VARIETY.

There is much more evidence on the subject, all showing that the productiveness of a variety depends on whether it happens to fit into the conditions of the locality where it is grown, or adapt itself to them. Take for instance the relative place as to productiveness of some varieties grown on the Central Experimental Farm, Ottawa, and on the Experimental Farm at the Ontario Agricultural College, Guelph, Ont.

Of 52 varieties of pease compared on the Experimental Farm at Guelph, Ont, a variety named *White Wonder* stands at the **head of the list** for productiveness on the average of eight years' test; it stands **third** on the list there for productiveness in 1898. The variety named *White Wonder* stands **lowest** on the list of the varieties compared at the Central Experimental Farm, Ottawa, in 1898.

The variety *Early Britain* stands **third lowest** (55th) on the list of varieties of pease compared as to productiveness on the Central Experimental Farm, Ottawa, in 1898; whereas it is the variety which gave the **highest yield** per acre of the varieties of pease tested by experimenters of the Experimental Union throughout Ontario in 1898; and it stands **second highest** on the average for eight years of all the varieties grown on the Experimental Farm at Guelph, Ont.

What is true of pease appears to be true also regarding other farm crops. Of the varieties of wheat, oats and barley compared on the Dominion Experimental Farms in 1898, selected lists were made of the **12 varieties** of wheat and oats, which gave the largest yields of grain per acre on each of the five Experimental Farms; and similar selected lists were made of the **6 varieties** each of six-rowed and two-rowed barley. The



following table shows the number of varieties compared, and the number of those varieties which appeared in the selected lists of the most productive at the several farms.

VARIETIES OF GRAIN COMPARED.

Class of Grain.	Number of varieties compared.	Number of varieties in selected lists.
Pease.....	47	32
Wheat.....	42	33
Oats.....	65	41
Six-rowed barley.....	18	14
Two-rowed barley.....	23	18
Totals.....	195	138

That table shows that of the whole number of varieties compared, no less than 70 per cent appear in the selected lists of those more productive—(12 or 6)—at some one of the five farms.

VARIETIES OF SPRING WHEAT.

Out of the forty-two varieties compared on the Experimental Farms at Ottawa, Ont., Nappan, N.S., Brandon, Man., Indian Head, N.W.T., and Agassiz, B.C., no less than thirty-three varieties appear in the lists of the twelve best at each farm, thirty-three selected out of forty-two.

When you take the reports of three years' experience with varieties of spring wheat on the Central Farm, and examine the names of the twelve varieties which on the average have given the heaviest crops of grain for 1895-96-97, and compare them with similar lists for 1895-96-97-98, you find the names of ten varieties appear in both lists of twelve. When there is selection of heavy seed and it is sown again in the locality where it was productive, the number of varieties, that repeat themselves as most productive there, is increased; and the total number recommended gets smaller. But where you have the varieties scattered promiscuously over the Dominion, you have the results shown by these reports,—sometimes the variety which is at the head of the list on one farm being at the bottom of the list on another farm in the same season.

*By Mr. McMillan :*

Q. When you say that the number of these lists gets smaller when the seed is kept for a larger number of years in one place, does not that show that if you had kept them all the time in one place they would all fail? In the county of Huron we got Black Sea wheat once. It was successful with us for some time and then failed. A farmer took it down to Hamilton and had it grown and took it back; and it would grow well with us again. With Siberian wheat it was the same. I am almost convinced that it is almost a necessity to change the seed on a farm.

The CHAIRMAN.—I do not think the two conflict.

Mr. ROBERTSON.—In the instances cited by Mr. McMillan there was, as far as I gathered from his remarks, a continuous growth of wheat in one locality without selection of the best seed from it from year to year; then it was taken to a new locality, grown there, and then brought back again, after a number of years, to the original locality. Without selection of the best from the best continuously, a variety will doubtless deteriorate; but selection will not only prevent deterioration of the variety but will improve it.

In the reports of three years' experience of wheat at the maritime provinces farm, I find eleven in both lists out of twelve selected; at Brandon, eleven in both lists of twelve; at Indian Head, N.W.T., eight in both lists of twelve, and at Agassiz, B.C.,

eleven in both lists of twelve. I think that indicates that selection from the variety of grain, which has been productive in the locality where it is to be grown, will increase its productiveness there year by year.

#### VARIETIES OF OATS AND BARLEY.

An examination of the records of the tests of varieties of oats gives similar results to those of pease and wheat. Out of the 65 varieties grown at the five Experimental Farms in 1898, no less than 41 varieties appear in the five lists of the twelve most productive varieties. The variety *Danish Island* (42 bushels per acre) which yielded lowest at Ottawa was the **very highest** at Agassiz, B. C. (85 bushels per acre). The tests of six-rowed and two-rowed barley point in the same direction. There is nothing to indicate a variety which is sure to be the most productive, or even likely to be the most productive, in any locality without an actual trial of it there; and if it happens to hit the conditions aright, its superior productiveness can be maintained only by selection of the best seeds of it for sowing from year to year. Selection and sowing of the heaviest and largest seeds of any variety, from the crop on the piece of land where it has given the largest yield, will increase its productiveness from year to year in that locality.

*An Hon. Member :*

Q. And increase its quality?

A. I am speaking only of its productiveness; but I think the quality would be improved also in the same way at the same time.

*By Mr. McMillan :*

Q. Do we understand that the best way is to keep on sowing the best seed from the same grain?

A. Yes, I believe, and my belief is founded on good and abundant evidence, that the quickest and surest way to increase productiveness is to select seeds from the most productive crops and plants in the locality where they are to be grown again.

In any field of growing grain some plants are more vigorous than others in the same field. Some plants are larger than others beside them. Some plants are earlier; and some single plants are more productive than others. Thus you have variation continually occurring. By selecting seed from those of them which have varied in desired directions (the best) and sowing it; and by taking again seed from those that succeed best next year and sowing it, continuous improvement can be effected. Of course there are instances where individual plants may be larger and more vigorous than others from exceptional causes. The droppings of a cow will make an individual plant here and there larger than the others; but apart from these causes there are other plants which are larger and more vigorous than those growing around them.

#### THE POWER TO OVERCOME OBSTACLES.

Apparently some plants are larger and stronger and earlier than others because they inherited the power to overcome obstacles. No other quality inherited is worth naming in comparison with the power to overcome obstacles; and there is no evidence of the existence of that power excepting in having overcome them. This power of overcoming obstacles in a plant may be revealed in the taking possession of things through its roots and leaves, that it may organize those things into itself for its own highest development, and for better and larger usefulness through its life. The principle is applicable to all forms of life from the lowest to the highest, from the plant to the man.

The power to overcome obstacles, the power to get possession of things, and the power to organize them after they have been taken into possession, this power marks the superiority of the individual in every field, in every field on the farm, and in the nation. The power to overcome obstacles, to get possession of things and to organize them, is superiority, by an eternal law that man can neither repeal nor amend.

There is the transmitted power to overcome obstacles, and in this lies the advantage of large plump seeds over small ones. The large seed gives the young plant sufficient nourishment at the critical period. That is all the quality of largeness in the seed does. From the same plant come big and little seeds grown on the same stalk. The larger seeds contain more nourishment for the young plant at the proper time ; and that gives the more vigorous growth.

## MELDRUM WHEAT.

Let me cite an instance to show the advantage to be derived from the continued selection of seed. Up in the Gatineau Valley there lived a man named Meldrum. His farm was in no way specially well adapted for growing fine wheat. He had several daughters and they went out into the fields and picked out the big early heads of wheat from large vigorous plants. The seed from these he cleaned thoroughly and sowed for wheat again. He got exceptionally good vigorous plants with large heads and fine wheat. The result of his selection was that his wheat took the gold medal at the great Paris Exposition ; and for years afterwards his wheat was sold as Meldrum wheat, and at fine prices for seed wheat.

The point I am now coming to is the result on the crops from the size of the seeds sown.

I have mentioned already the fact that selected large pease were sown side by side with selected small pease of the same variety, on the Central Experimental Farm, Ottawa, in 1896. The selection was repeated and large pease from the crop from large pease, and small pease from the crop from small pease were sown in 1897 and 1898.

The following tables show the average result in the weight of the pease, without selection, in the crop of 1898 :—

## PRODUCT FROM LARGE AND SMALL PEASE.

	Weight per 100 pease (in grains).
From large seed .....	538
From small seed .....	270

J. C. Arthur, of Purdue University, quotes an instance showing the quantities of first and second quality of pease respectively, which came from large and small seeds respectively. It is shown in the following table :—

	Weight of Pease in grams. First quality.	Weight of Pease in grams. Second quality.
From large seed .....	1,375	554
From small seed .....	540	1,045

That is to say, of every 24 pease grown in the crop from large seed, about 17 were of first quality as against 7 of second quality ; and of every 24 pease grown from small seed, about 8 were of first quality as against 16 of second quality.

The same author quotes some results from tests by Lehmann, as shown in the following tables :—

(When an equal number (528) of each was sown).

	Weight of pease in grams.	Percentage of increase.
From large seed .....	1,814	81
From small seed .....	998	

*By Mr. McMillan :*

Q. Sowing an equal number did you say ?

A. Yes. Now I will give the results from sowing an equal weight of each.



(When an equal weight of each was sown.)

	Weight of pease in grams.	Percentage of increase.
From large seed.....	2,307	52
From small seed.....	1,590	

EXPERIMENTS AT O. A. C. FARM, GUELPH.

I want to offer some further evidence obtained from another reliable source, in regard to the benefits from selecting large and heavy seed for sowing; and also some evidence on the apparent improvement in the productiveness of varieties from selecting seed of them on the farm where they are to be grown year after year. I take it from the last report of the Experimental Farm at Guelph, Ont.,—the experimental farm of the Ontario Government. The experiments in seed-testing and the comparison of varieties there are under the charge of Mr. C. A. Zavitz, who is a most capable and careful worker. Experiments have been conducted by him to determine the results from sowing selected large seeds and small seeds taken from the same crop of the previous year. Fresh seed has been taken each year; so that the difference in yield is attributable to only the difference in the size of the seeds sown. The different selections were sown upon plots exactly one rod square. The following table gives the results of the average of the yields per acre, for the number of years in which the comparisons were made :

PRODUCTS FROM LARGE AND SMALL SEEDS.

Class of Grain.	Selection.	Number of years compared.	Average of yield per acre.	Percentage of increase over small seed.
			bushels.	
Barley.....	Large plump seed.....	4	46.73	7
".....	Small ".....	4	43.30	
Spring wheat.....	Large ".....	6	21.25	23
".....	Small ".....	6	17.27	
Oats.....	Large oats.....	5	52.38	37
".....	Small ".....	5	37.96	
Pease.....	Large seed.....	3	24.03	34
".....	Small ".....	3	17.88	

That table shows the very great benefit from selecting large heavy seeds to sow, even if the selection is not carried any further than that.

Moreover when the selection of large seeds is continued from year to year out of the crop grown from large seeds, there is an improvement in the **quality** of the crop as well as in the yield per acre. Mr. Zavitz reports an experiment in the selection of seed oats for six years in succession. The experiment was begun in 1893, by selecting seed from the general crop of *Joanette* oats of the previous year. The selection in each of the following years was made from the product of the selected seed of the previous year. The following table gives the results of the average of the yields per acre. In the weight of grain per measured bushel, the average is for six years; and in the yield of grain per acre the average is for five years.

## PRODUCT FROM LARGE AND SMALL OATS.

	Average weight per measured bushel. Lbs.	Average yield per acre. Bushels.	Percentage of increase.
From large plump oats.....	33·03	58	20
From small light-weighting oats...	30·3	48·1	

The difference between the average yield per acre from large plump seed, selected out of the product of selected seed for six years in succession, is practically 10 bushels per acre more than the average yield per acre from small light-weighting seed selected out of the product of similar seed. The increase is more than 20 per cent.

It has been proved over and over again that the largest and heaviest seeds produce the largest and most vigorous plants. In grass and clover seeds the small ones are usually inferior and of low vitality. They cannot be depended on to produce a "good catch" or a good stand of plants. In all cases of farm crops a greater proportion of the large seeds germinate. This is followed up by a more vigorous growth; and the growth is also towards a larger yield of large plump seeds of high quality, with which to continue the strain.

## DOES SEED RUN OUT?

That brings me to say a few words on the subject of whether a strain of seed, or a variety, will deteriorate in productiveness by being grown on the same farm from year to year. I submit some further evidence from the report of the Experimental Farm of Guelph, Ont. If the different varieties of grain grown on that farm continuously for eight or ten years have deteriorated in productiveness, then there should be some evidence of a gradual decrease in the yield, independently of the fluctuations due to the season. On the contrary, the records of yields show that there is a progressive increase in the yield per acre of the varieties which have been grown for the longest periods on the same farm. There are variations and slight exceptions to that, but that is the rule as shown by the records of yields.

*By Mr. Burnett :*

Q. Grown on different varieties of soil?

A. Grown on the same farm, and all the varieties grown under similar conditions for fair comparison every year.

In the report of the tests at that farm I find that with wheat, oats, barley and pease, the average yield of grain per acre for the last three years is higher from the varieties which have been grown on the farm continuously for eight or ten years, than from the varieties grown on it from one to three years only.

*By Mr. McMillan :*

Q. The same varieties? If the varieties change that is not a fair test?

A. The comparison is between the best varieties which have been grown on the same farm for a long time, and the best new varieties brought on to it. The comparison is for the same years and under the same conditions of cultivation. My point is this: assurance of productiveness does not come with any new variety; but comes with *selection of seed every year from any variety which has proven productive in that locality.*

There are great differences between the productiveness of varieties. But I do not know of any means whereby one can tell beforehand whether a variety new to the locality will be productive there. The fact that some varieties, which were most productive on some of the experimental farms in 1898, were among the least productive on other experimental farms in the same season and *vice versa*, is evidence that superior productiveness does not continue in the variety in different localities and conditions.

The safe practice for the farmers is to select large and heavy seed from any strain which is of good quality for the market, and which has been productive in their locality

A still greater improvement than that is practicable. The selection of seeds from the largest, earliest, most vigorous plants as they grow would give the very best seeds from that strain or variety. The power to overcome obstacles, which is in evidence in the largest and most vigorous plants, is worth seeking in the seeds from such plants.

One day's work of selection when the crop is ripe, would yield the farmer enough heads from the best plants for two bushels of cleaned seed. That should be cleaned thoroughly ; and the small light seeds taken out by a stiff fanning and sieving. These two bushels (more or less) of selected seed should be sown on a plot of well prepared fertile land. The crop from that will furnish seed for the general crop of the farm of that class or grain. It is important that that plot should be in the best possible condition for crop growing. The productive qualities of those selected seeds are improved by being grown on land which bears large crops. Before the crop from the seed grain plot is harvested, a selection of the heads from the most productive and vigorous plants should again be made. These furnish the seed for the seed-grain plot the succeeding year. The seed-grain plot itself should be one on which a well-manured root or green crop or a clover crop was grown the previous year. In a few years a farmer could grade up the strain of seed on his farm to yield from ten to twenty per cent more per acre. Even if he does not follow that systematic selection, if he sows only heavy, plump seeds, from the largest yielding crop he can find in his locality, he will derive very great benefit.

When I mention these percentages, what does 10 or 20 per cent or 30 per cent of increased yield in the crops over this Dominion mean ? The value of the crops being about \$280,000,000, ten per cent is \$28,000,000 a year. I believe we can get that increase in Canada by the means I have outlined to-day ; that is my judgment in regard to the farmers of Canada in this work.

#### LARGE AND SMALL POTATOES.

Before I finish, let me say one word about potatoes. Mr. Zavitz carried on an experiment in using large marketable potatoes and small potatoes (not very small—1½ inches in diameter) for planting. He has done that for four years. The large potatoes for planting every year are selected from the produce of large potatoes planted the previous year. The small potatoes are from the produce of small potatoes. The average yield for the four years 1895-96-97-98 was 201 bushels per acre from the large potatoes and 131 bushels per acre from the small potatoes. That was a gain of over 69 bushels to the acre annually, on the same soil, in the same seasons, for four years, from planting large potatoes. This was due probably to some extent to the inherited vigour, and also to the larger amount of nourishment for the young plant in the larger potatoes planted.

*By Mr. Rogers :*

Q. Was that for one year or an average ?

A. That was the average for the four years.

#### ROOT CROPS FROM LARGE AND SMALL SEEDS.

Mr. Zavitz conducted a comparison in growing mangels from large plump seed and small seed for four years ; also in growing carrots for four years ; and in growing sugar beets for two years, and Swede turnips for three years in similar ways. Taking the average of all these for those years, the average yield from large plump seeds was 24·88 tons to the acre ; and the average yield of the same classes and varieties of roots grown from small seeds was 15·91 tons per acre. That is nearly the difference between 25 tons to the acre in one case, and 15 tons in the other for that number of years.



## THE TWO FUNDAMENTAL PRINCIPLES.

I think the evidence is abundant and clear to establish a belief in these two fundamental principles which underlie the successful growing of crops in Canada. The first one is that a proper rotation of crops will greatly increase the yield per acre; and that a proper rotation can be planned when a farmer understands the difference between conditions favourable to the processes of growth which make for the increase of the roots, stalks and leaves of plants, and those favourable to the formation of seeds. Barn-yard manure is for the roots, stalks and leaves primarily; and a fine condition of tilth is for the grain crops the following year.

The other fundamental principle in support of which also the evidence is clear, is that the only sure way of improving the grain of a locality and of increasing the productiveness of varieties suited to it, is by a selection of seed from the crops and plants that have succeeded best there or under similar conditions, and by doing that year after year successively.

*By Mr. Douglas:*

Q. Why in the North-west is it the case that although White Fife grows best on the land and seems to improve in quality and once was the most expensive, it does not now bring as high price as the Red Fife?

A. I do not know.

Q. We have sown White Fife for a number of years and find it improves in quality; but within the last two years [the] price has not been given for it. Formerly the same price was given.

## A CHANGE OF SEED.

Mr. ROBERTSON—Regarding a change of seed, I would like to mention this further. A change of seed brings out the tendency to variation in the time of ripening and in the productiveness. Therefore, when it is desired to get in any locality an earlier ripening variety of grain, a good plan would be to take a variety of good quality for the market, from a northern to a southern locality. Then select seeds from the vigorous, large plants that ripen earliest. By following up the selection, in a few years you would likely get crops that would grow better and ripen earlier. I would suggest that as a means of bringing about the earlier ripening.

If the farmers of Canada can be encouraged to select out of their crops of each class of grain this year, enough heads from the vigorous plants, enough big heads from the largest plants, to yield two bushels of clean grain of each, they will have taken a great step in advance. Let them follow that up; and clean that grain thoroughly to get the additional value of large heavy seeds out of these selected heads. Such selected seed should be sown on a seed-grain plot from which a clover crop or green crop had been taken the year previous. From that crop seed for the general crop of the farm the following year would be obtained. A selection of heads should be made from the seed-grain plot every year before it is cut. Those are for seed for the seed-grain plot of the following year. Every bit of evidence indicates that such seed would be greatly more productive than any seed they can get from any other source. That will be one of the main values of the Illustration Stations. If you want the farmers as a whole to receive and apply a principle you have to give them object lessons of the application of that principle. Otherwise the principle may become to them a theory only and not lead to an improved practice. The object lesson, of the crops growing from selected seeds along side crops from seed that is not selected, would be a splendid illustration of the best practice to follow throughout the Dominion.

## COMMITTEE ROOM No. 46.

HOUSE OF COMMONS, 9th May, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 o'clock, a.m., Mr. Bain, chairman, presiding.

Mr. JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying, being present, continued his evidence as follows:—

Mr. Chairman and Gentlemen,—At the last session of the Committee I submitted some evidence showing that superior productiveness of varieties of grain depends upon the locality and conditions under which they are grown, rather than upon the variety as such. I said further that in my judgment there was no need for a change of grain; and that a change of grain made the farmer incur very much risk and often gave him no benefit. There was no time to submit fully the evidence on which I based the latter statement and all I desire to do this morning is to submit some of the evidence I have.

First of all allow me to supplement what I said in regard to the effect of change of locality and conditions of growth upon the productiveness of a variety to show that the variety as such, does not maintain superior productiveness, except as it happens to hit successfully the conditions of the locality. It maintains the form, the colour, the habit of growth and hardiness, characteristic of it; but it does not hold equally productiveness except as the circumstances suit it. I said that last year—1898—65 varieties of oats were compared in five localities in Canada where the experimental farms are situated. The lists of the twelve most productive at each place included no less than 41 of these varieties. That made me think that the conditions under which a variety of grain is grown change its relative productiveness so much that you have **no constant superiority** in any variety when the locality and conditions under which it is grown are changed. If the 24 varieties, which are not named in the five lists of 12 most productive, were among the poorest yielders on all the farms, they could be discarded. That is not the case. A variety which is at the head of the list at Agassiz, B.C., is at the very bottom of the list—the 65th—at Ottawa.

Let me submit a table showing the **relative place** in the order of productiveness at the four other experimental farms of the 12 varieties of oats which were **most productive** at the Central Experimental Farm, Ottawa, in 1898.

RELATIVE PRODUCTIVENESS OF 65 VARIETIES OF OATS.

Name of Variety.	Relative place in Order of Productiveness on Experimental Farms at				
	Ottawa, Ont.	Nappan, N.S.	Brandon, Man.	Indian Head N.W.T.	Agassiz, B.C.
Hazlett's Seizure.....	1st	30	29	51	47
Joanette.....	2nd	52	42	48	58
Brandon.....	3rd	53	59	36	63
Oderbruch.....	4th	7	19	7	50
Golden Beauty.....	5th	39	31	33	10
Black Mesdag.....	6th	16	69	66	13
Early Golden Prolific.....	7th	36	18	14	49
Improved Ligowo.....	8th	62	43	55	28
Holland.....	9th	55	21	30	52
Russell.....	10th	57	46	37	41
King.....	11th	49	55	25	60
Abundance .....	12th	3	24	21	39

All the varieties tested were reported as being grown on plots side by side on each Experimental Farm in the same season.

If you run the eye along the line opposite each variety you will see there is no **constant superiority** in productiveness when a variety is grown in the different localities in the same season. Varieties which are among the most productive in one place are among the least productive in another place.

If there was not much difference between the yields per acre of different varieties on the same farm, then the change of place in the order of productiveness on the different farms would not be of much moment. But the difference between the yields per acre from different varieties on the same farm is very great; and there are varieties at almost regular intervals between the highest and lowest yield on each farm. The following table shows the yield in bushels per acre of **the most productive and the least productive variety** on each farm, and also the difference between the highest and the lowest on each farm.

DIFFERENCE IN YIELDS PER ACRE : OATS.

Where Grown.	Name of Variety.	HIGHEST.	LOWEST.	DIFFERENCE
		Bushels per Acre.	Bushels per Acre.	Bushels per Acre.
Ottawa, Ont. ....	Hazlett's Seizure .....	89	.....	} 47
	Danish Island. ....	.....	42	
Nappan, N.S. ....	Thousand Dollar.....	50	.....	} 28
	Pense .....	.....	22	
Brandon, Man. ....	White Giant.....	114	.....	} 60
	Scotch Hopetown.....	.....	54	
Indian Head, N.W.T. ....	Buckbee's Illinois.....	79	.....	} 50
	Black Mesdag.....	.....	29	
Agassiz, B.C. ....	Danish Island.....	85	.....	} 43
	Prize Cluster.....	.....	42	

You will observe that some varieties are much more productive than others on the same farm; but as has been, the varieties which are most productive in one locality, do not maintain their superiority when grown in another locality. A striking instance of that is shown in the fact that the variety *Danish Island* which is at the head of the list at Agassiz, B.C., with 85 bushels to the acre, is at the very bottom of the list of 65 varieties at Ottawa, Ont., with 42 bushels to the acre.

Let me now submit a table showing the relative place in the order of productiveness at the four other Experimental Farms of the 12 varieties which were least productive at the Central Experimental Farm, Ottawa, Ont., in 1898.



## RELATIVE PRODUCTIVENESS OF SIXTY-FIVE VARIETIES OF OATS.

Name of Variety.	Relative place in Order of Productiveness on Experimental Farms at				
	Ottawa, Ont.	Nappan, N. S.	Brandon, Man.	Indian Head, N.W.T.	Agassiz, B.C.
Poland.....	53rd	34	65	24	59
White Wonder.....	54th	28	71	57	21
Siberian, O. A. C.....	55th	19	40	16	48
Cromwell.....	57th	47	27	61	5
Rosedale.....	58th	44	53	2	31
Welcome.....	59th	37	33	54	55
Prize Cluster.....	60th	6	56	50	66
Medal.....	61st	61	62	41	38
Rennie's Prize.....	62nd	22	70	53	33
Abyssinia.....	63rd	8	32	4	34
Prolific Black Tartarian.....	64th	33	22	34	8
Danish Island.....	65th	27	14	43	1

Again, if you run the eye along the line opposite each variety you will see there is **no constant inferiority** when a variety is grown in different localities in the same season. Varieties which are among the **least productive** in one locality are among the **most productive** in another locality. In fact, the very least productive variety at Ottawa is the most productive variety at Agassiz, B.C. The 3rd least productive variety at Ottawa—*Abyssinia*, the 63rd from the top—is the 4th most productive at Indian Head, N.W.T.; and is the 8th from the top of the list at Nappan, N.S. The variety—*Rosedale*—which is the 58th from the top at Ottawa, is 2nd from the top at Indian Head, N.W.T.

Varieties of other classes of grain, wheat, barley and pease, grown at the Experimental Farms in 1898, show similar changes in relative place in the order of productiveness.

## FORTY-TWO VARIETIES OF SPRING WHEAT.

RELATIVE place in the order of productiveness at the four other Experimental Farms of the 12 Varieties Highest at the Central Farm, Ottawa, for the Season of 1898.

	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.
Highest and lowest yield in bushels per acre.....	31 15	25 12	45 18	45 21	31 23
Name of Variety.	Ottawa.	Nappan, N. S.	Brandon, Man.	Indian Head, N.W.T.	Agassiz, B.C.
Plumper.....	1st.	22	41	42	10
Rio Grande.....	2nd.	14	24	20	21
Emporium.....	3rd.	10	30	15	34
Wellman's Fife.....	4th.	1	6	6	12
Blair.....	5th.	38	35	36	28
Preston.....	6th.	26	15	10	8
Colorado.....	7th.	13	29	39	14
Goose.....	8th.	27	1	29	26
Rideau.....	9th.	20	34	30	16
Beaudry.....	10th.	19	33	23	6
Vernon.....	11th.	29	21	27	7
Red Fern.....	12th.	25	19	21	31

## FORTY-TWO VARIETIES OF SPRING WHEAT.

RELATIVE place in the order of productiveness at the four other Experimental Farms of the 12 Varieties Lowest at the Central Farm, Ottawa, for the Season of 1898.

	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.
Highest and lowest yield in bushels per acre.....	31 15	25 12	45 18	45 21	31 23
Name of Variety.	Ottawa.	Nappan, N.S.	Brandon, Man.	Indian Head, N.W.T.	Agassiz, B.C.
Red Fife.....	31st.	18	<b>7</b>	<b>3</b>	<b>11</b>
Blenheim.....	32nd.	17	23	18	20
Mason.....	33rd.	42	40	38	38
Dawn.....	34th.	40	31	24	32
Advance.....	35th.	29	36	17	37
Dufferin.....	36th.	32	<b>9</b>	25	27
Ladoga.....	37th.	36	39	41	23
Alpha.....	38th.	5	26	35	19
Old Red River.....	39th.	22	14	22	17
Admiral.....	40th.	<b>6</b>	20	28	13
Beauty.....	41st.	<b>3</b>	22	16	33
White Russian.....	42nd.	41	<b>11</b>	<b>9</b>	<b>9</b>



## FORTY-SEVEN VARIETIES OF PEASE.

RELATIVE place in the order of productiveness at three other Experimental Farms of the  
12 Varieties Highest at the Central Farm, Ottawa, for the Season of 1898.

	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.	Highest. Lowest.
Highest and lowest yield in bushels per acre.....	46 20	... ..	59 23	57 28	39 22
Name of Variety.	Ottawa.	Nappan, N.S.	Brandon, Man.	Indian Head, N.W.T.	Agassiz, B.C.
Arthur .....	1st.	No record.	13	47	27
Elephant Blue. ....	2nd.		27	11	6
Macoun ....	3rd.		31	48	5
Picton .....	4th.		19	27	11
Pride ..	5th.		4	7	19
Prussian Blue..	6th.		21	32	31
Perth.....	7th.		2	3	38
Crown .....	8th.		47	6	8
Multiplier.....	9th.		32	44	12
Lanark.....	10th.		16	40	21
B. E. Marrowfat.....	11th.		9	35	44
Centennial .....	12th.		45	28	24

## FORTY-SEVEN VARIETIES OF PEASE.

RELATIVE place in the order of productiveness at three other Experimental Farms of the  
6 Varieties Lowest at the Central Farm, Ottawa, for the Season of 1898.

	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Highest and lowest yield in bushels per acre.....	46	20	.....	.....	59	23	57	28	39.	22
Name of Variety.	Ottawa.	Nappan, N.S.	Brandon, Man.	Indian Head, N.W.T.	Agassiz, B.C.					
Victoria.....	33rd.	No record.	29	13	18					
Agnes .....	34th.		46	38	3					
Gregory .....	35th.		36	37	13					
Early Britain.....	36th.		3	9	35					
French Canner.....	37th.		5	29	43					
White Wonder .....	38th.		6	14	2					
No record at Ottawa, 39 to 47 incl.										

If you run the eye along the line opposite the several varieties of spring wheat and pease, in several instances the variety which is at the head or near the head of the list on one farm is at or near the bottom of the list on another farm. Such tests of varieties are like trial by hazard or chance ; some hit, some miss—that and nothing more. I did not come to that conclusion hurriedly nor do I make the statement carelessly. That would be unpardonable. I looked at the evidence carefully. It convinced me that growing of varieties in different localities without systematic selection gave only a chance of success to the ones that happened to hit the conditions aright. Then I compared trial by hazard of an equal number of varieties (of pieces of paper) with the records of the tests on the farms ; and I found them to agree almost exactly, both as to the total number in the selected lists and the number of times any one variety appeared in the lists. In the truest sense I suppose nothing happens by chance, but the word has a well-known meaning and is used to account for what we cannot otherwise explain.

I took 65 small pieces of paper and numbered them from 1 up to 65. Then they were put into a small box. Twelve of them were shaken out through a small hole in the lid. The numbers of them were recorded. They were put back into the box and twelve more were shaken out. The numbers on them were also recorded. That was done five times. The five lists of twelve each were to represent the five lists of twelve varieties each. Out of the 65 numbers, the lists of twelve each contained 43 numbers.

Then 47 pieces of paper to represent the number of varieties of pease were dealt with in a similar way. The numbers on the lists of twelve each were 33.

The following table shows how closely the hazard drawing of the numbers agrees with the number of varieties of grain on the selected lists from unselected sowing :

UNSELECTED SOWING *versus* SELECTION BY CHANCE.

Class of Grain.	Number of varieties compared.	Number of varieties in selected lists.	Numbers selected by hazard or chance	
			Lowest.	Average of six trials
Oats.....	65	41	41	43
Pease.....	47	32	30	33
Spring wheat.....	42	33	32	33
Six-rowed barley.....	18	14	15	16
Two-rowed barley.....	23	18	13	17
Totals.....	195	138	131	142

The selected lists, from the results of growing 195 varieties, without any selection of the variety and seed, known to be adapted to the locality, contain 70 per cent of the whole number ; and the lists from the average of six trials by chance or hazard contain 72 per cent of the whole of the numbers.

I do not submit that to prove anything ; but to illustrate that I do not find the quality of superior productiveness in any variety except as it happens to hit the conditions of the locality right. When one finds a variety or strain which does that, then the wise course is to stick to that and improve it further by continued selection of the best seeds from it from year to year.

I submit some charts which I have prepared to show the yield per acre of some varieties of grain which have been grown for eight or ten years on the Experimental Farm at Guelph, Ont. ; and also the yields per acre of the best varieties new to that Farm.

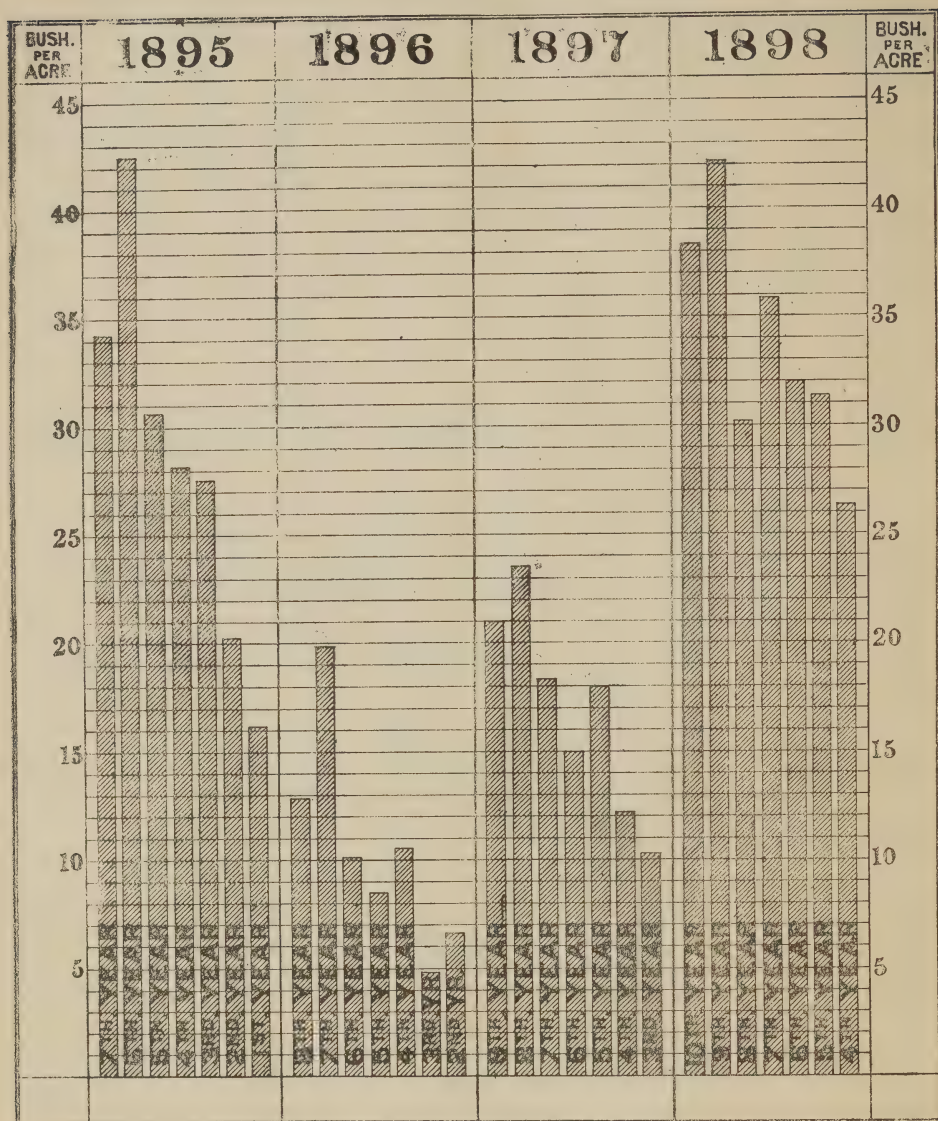
Chart No. 1 shows the yield per acre of nineteen varieties of spring wheat at the Experimental farm, Guelph, Ont., in each of the four years, 1895, 1896, 1897 and 1898. Each column (except one) under 1895, represents the average yield of three varieties of wheat. The column seventh year, represents the average yield of the three most productive of all the varieties which at that time had been grown on the farm for seven years ; the column sixth year, represents the average yield of the three most productive of all the varieties, which at that time had been grown on the farm for six years ; and so on through all the columns, except the last (first year), which represents only one variety, there being only one new variety recorded in that year. Thus the comparison, under 1895, is between the averages of the three most productive varieties which had been grown on that farm continuously for seven, six, five, four, three, two and one years respectively.

The columns under 1896 represent the average yields of the same varieties in 1896 on the same farm. The varieties which are in the column seventh year, in 1895, are in the column eighth year in 1896, in the column ninth year in 1897, and in the column tenth year in 1898. The same is the case for the other varieties, the column sixth year in 1895 becomes column seventh year in 1896, and so on.



## YIELDS PER ACRE OF VARIETIES OF WHEAT.

Chart No. I.



It will be seen that the varieties which have been grown on that farm for the longest periods—seven to ten years and six to nine years—have given the highest yields per acre in each of the four years. The season of 1896 was most unfavourable for wheat at Guelph. The varieties which had been on the farm for a considerable number of years (seven and eight years respectively) yielded proportionately better in the unfavourable season than those which were new to the farm.

## YIELDS PER ACRE OF VARIETIES OF OATS.

Chart No. 2.

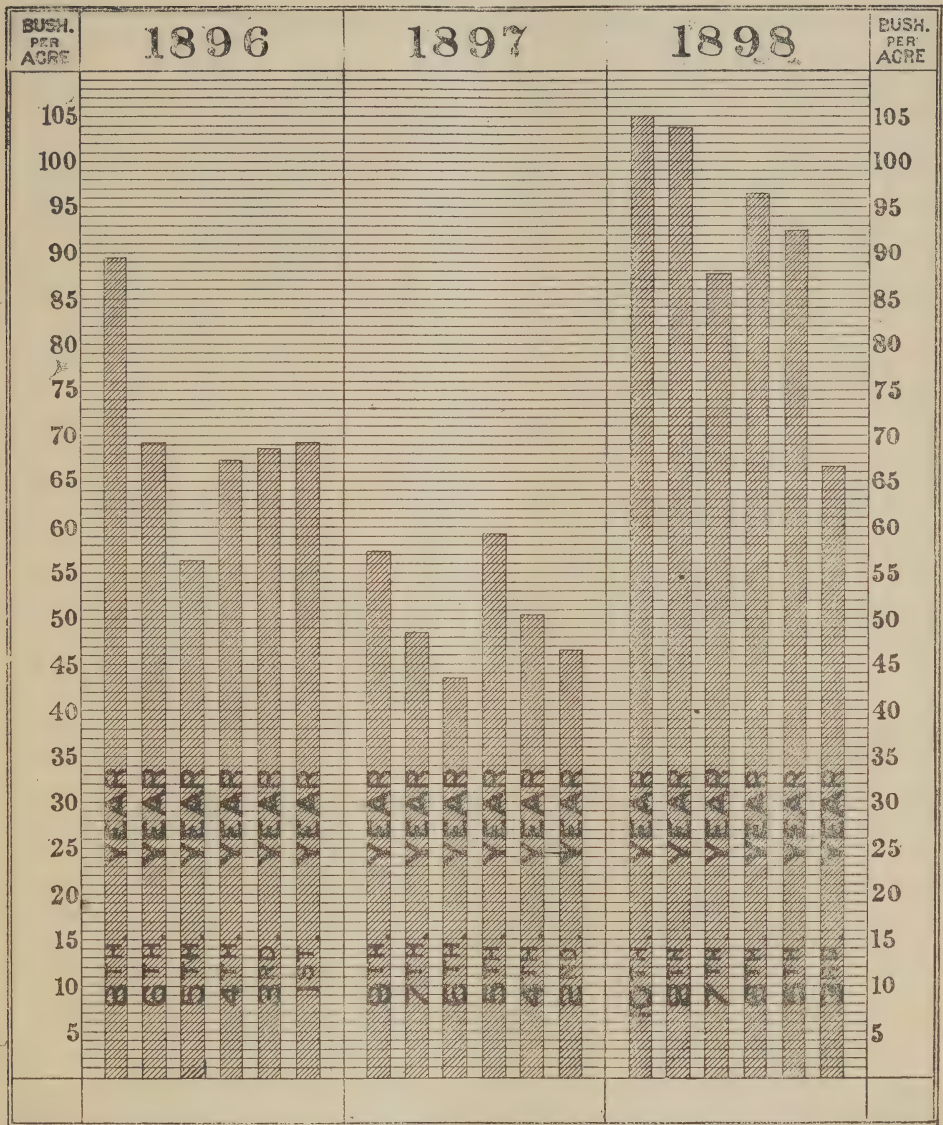


Chart No. 2 shows the yield per acre of eighteen varieties of oats at the Experimental Farm, Guelph, Ont., in each of the three years 1896, 1897 and 1898. Each column under 1896 represents the average yield of the three most productive of all the varieties which at that time had been grown on the farm for the number of years on the column. The columns under 1897 and 1898 represent the yields of the same varieties on the same farm in those years respectively. The general arrangement of the chart is the same as chart No. 1. It will be seen that the varieties which have been grown on that farm for the longest period—eight to ten years—have given the highest yields per acre.



## YIELDS PER ACRE OF VARIETIES OF BARLEY.

Chart No. 3.

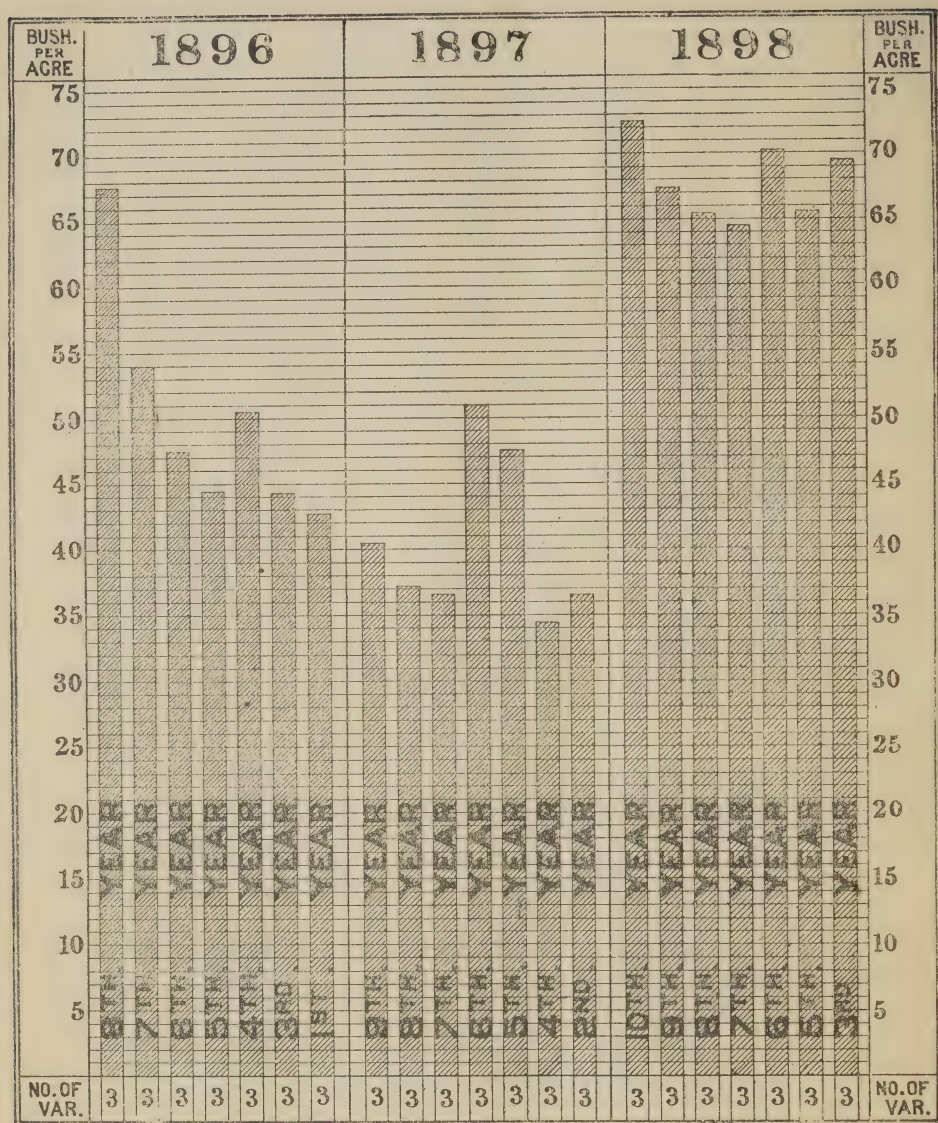


Chart No. 3 shows the yield per acre of twenty varieties of barley at the Experimental Farm, Guelph, Ont., in each of the three years 1896, 1897 and 1898. The column first year under 1896 represents only two varieties; the other columns represent the average of three varieties each. The general arrangement of the chart is similar to No. 1 and No. 2.



Chart No. 4 shows the yield per acre of 14 varieties of pease at the Experimental Farm, Guelph, Ont., in each of the three years, 1896, 1897, 1898. The column first year under 1896 represents two varieties; the other columns represent the average of three varieties each. The general arrangement of the chart is similar to No. 1, No. 2 and No. 3.

## YIELDS PER ACRE OF VARIETIES OF PEASE.

Chart No. 4.

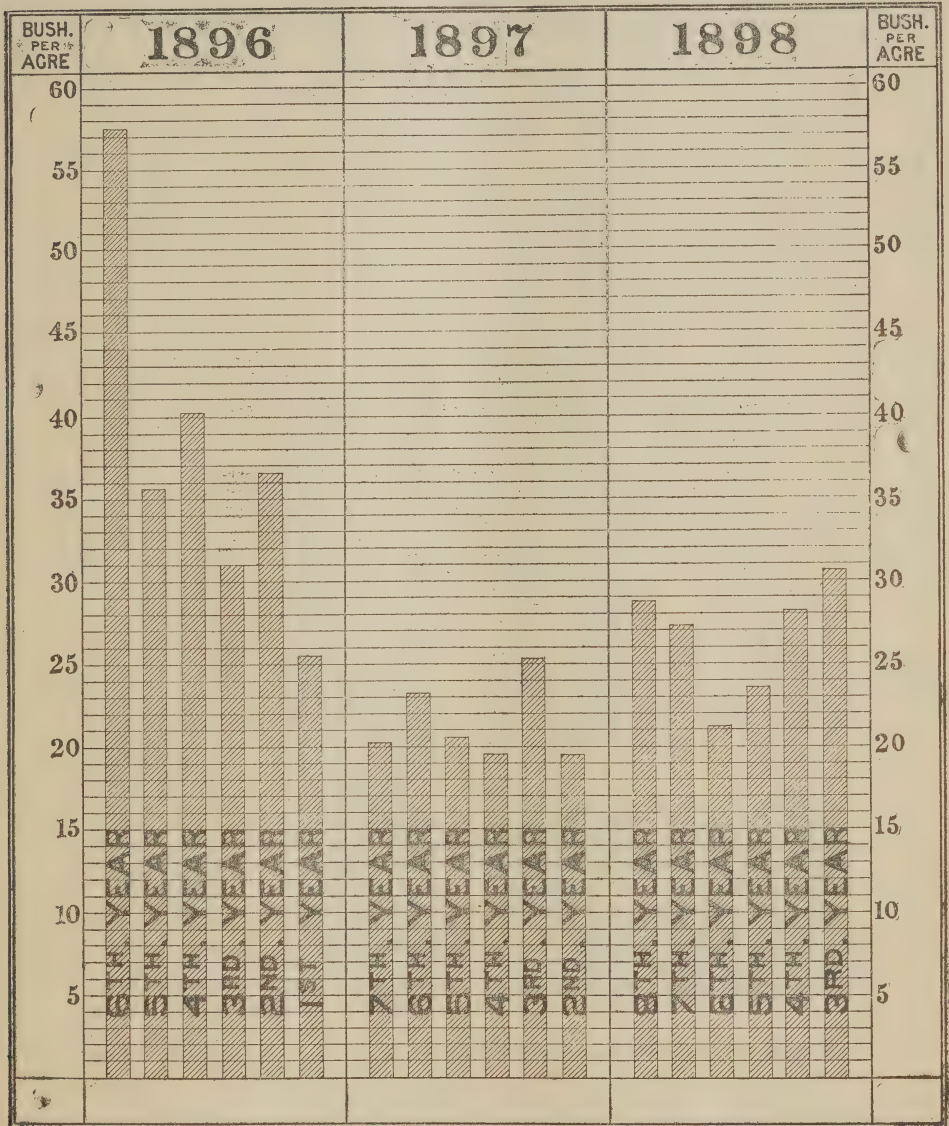


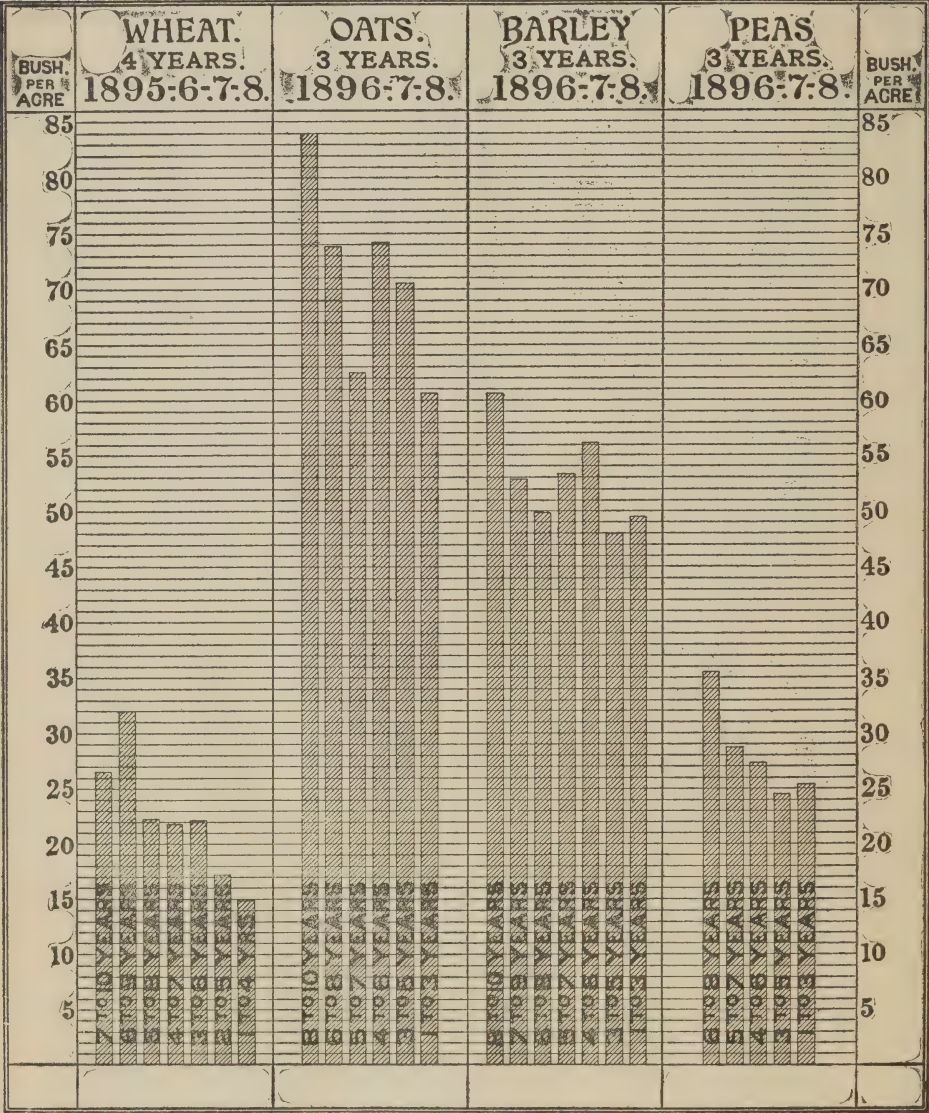
Chart No. 5 is a summary and average of Charts No. 1, 2, 3 and 4.

Under wheat, it shows the average yield per acre, for the four years 1895, 1896, 1897 and 1898, of the three best varieties which had been grown on that farm for the periods mentioned on the columns.

Under oats, it shows the average yield per acre, for the three years 1896, 1897 and 1898, of the three best varieties which had been grown on that farm for the periods mentioned on the columns.

AVERAGE YIELDS PER ACRE DURING SEVERAL YEARS.

Chart No. 5.



Under barley, it shows the average yield per acre, for the three years 1896, 1897 and 1898, of the three best varieties which had been grown on that farm for the periods mentioned on the columns.

Under pease, it shows the average yield per acre for the three years 1896, 1897 and 1898, of the three best varieties which had been grown on that farm for the periods mentioned on the columns.

The exceptions to each column representing the average of three varieties are :— Under wheat, the column one to four years, one variety ; under barley, the column one to three years, two varieties ; under pease, the column one to three years, two varieties.

The evidence is all in one direction ; and it shows that the varieties which have been grown on the farm for the longest periods have given heavier yields per acre than those varieties which were comparatively new to the locality.

The exception six to nine years under wheat appears to indicate that the three varieties represented in that column are better adapted to that locality than the three varieties represented in seven to ten years, and by far the heaviest yielder in the three varieties in column six to nine years is *Wild Goose*. The details of the average yields of the three varieties represented in each of these two columns are.

7 to 10 years.	Average yield for 1895-96-97-98.	
Bart Tremenia.....	31·1	bushels per acre.
Herison's Bearded.....	26·	"
Pringle's Champion.....	22·9	"
6 to 9 years.		
Wild Goose.....	36·8	"
Medeah.....	33·6	"
Red Fern.....	25·8	"

*By Mr. McMillan :*

Q. If productiveness depends on conditions, then all varieties sown should change no more than the difference between green berries and red. If it is in the surroundings they would all continue to yield alike. Now, we all know as farmers that is not so. Any man in farming practice knows that one variety will always yield more than another, everything else being equal.

A. Every variety varies in productiveness as the locality suits it or as it fits into the conditions of the locality. What suits one, does not suit the others. Whenever a variety suits the locality, the longer it is kept there the better it will become, if it is sown on good land and selection of the best seed from it is made every year.

*By Mr. Clancy :*

Q. This is a very interesting subject. It would appear that at least false doctrines have been taught in the colleges in the past. If I understood you right, aside from the values of varieties for different localities there is absolutely nothing else in them in regard to productiveness ?

A. I do not find that there is any constant superiority in a variety when it is changed from one locality to another.

Q. Farmers have found that there is an indubitable deterioration in sowing the same seed from year to year ?

A. At the last meeting, Mr. Bell (if I may use his name) said that he had been growing the same strain or variety of wheat for twenty years and now his seed is better and more productive than it was before. There is from generation to generation a deterioration, unless there is selection of the best for seed from year to year ; but by selection there may be continuous improvement as well as variation.

*By Mr. Featherston :*

Q. I would think the same thing would apply to live stock ?

A. Yes.

*By Mr. Henderson :*

Q. How is that selection first made ?

A. I would select in two ways. I would select the largest heads from the most vigorous and early plants in a field until I had two bushels of grain. That would give



me seed from the plants that have proven that they had adapted themselves to the conditions of that locality, and then I would select the heaviest and largest seeds out of these. I would select only out of a heavy crop. I would choose the best piece in a field or locality.

*By Mr. McMullen :*

Q. Does that principle of selection of seed hold good in the case of root crops as well as grain? In the case of potatoes for instance?

A. In potatoes, I think, it does. I gave some evidence of that when last before the committee.

*By Mr. Clancy :*

Q. Do you select the varieties that generally stand high in the list?

A. For those charts I have taken uniformly the three that stand highest.

Q. I am afraid that would be a blow at your theory of variety having nothing to do with productiveness?

A. I do not hold that variety has nothing to do with productiveness. It has a great deal to do with it. One variety often is very much more productive than another. To begin with, I would select the most productive variety or strain I could find in the locality. The point is that a variety very productive in one locality will not maintain its productiveness in another locality. The variety by selection will retain superiority in the same locality, but taken to another locality it may not do so. If you have a variety or strain that is succeeding in yielding large crops, further selection will maintain the superiority and improve it.

*By Mr. McMillan :*

Q. Your teaching is contrary to the teaching of all scientific men, and and it is contrary to my own experience of fifty years' farming in Canada. We have changed our seed steadily and have never grown for more than five or six years. Some varieties will improve the first and second year perhaps, and then after you have had them a number of years they will go down. Prof. Robertson has been studying this, but remember this is something that can be settled only after a number of years by practical experience on the one place.

A. While studying and investigating, I have collected the evidence of every good farmer I could find, including that of Mr. McMillan himself.

Q. Yes, but my evidence is not worth anything.

A. On the contrary, I value it highly; and while Mr. McMillan does not agree with all I have said, I think he will agree with it when I have made my meaning quite clear. I learned with a good deal of satisfaction while travelling with Mr. McMillan years ago when we were attending Farmers Institutes together, that whenever he found an exceptionally large crop of grain at any place which he visited, he would try and secure some seed from that crop and take it to his own place. That was obtaining seed from a strain which had been productive. I did not learn, however, that he followed that up by selecting the best seed out of that year after year in the manner which I have described. He kept on using the same seed over and over again without selection. The law of constant deterioration is in operation unless there is selection of the best as seed for the next generation. He began well by selecting grain that had proved itself to be superior in point of productiveness on a large area, under somewhat similar conditions to those which prevailed at his own place; and if he had kept on selecting seed from that grain as I have suggested, it is my belief that he would have had better crops year after year instead of the seed running out. The statements which I have made in this respect do not contradict, so far as I know, the teachings or statements of the competent authorities in regard to the science of agriculture of whom I know and have read. I know my conclusions are different from and contrary to some current suppositions in regard to the subject; but these suppositions have been leading us down hill in crop growing in Canada, while the truth will lead us up.

*By Mr. McMillan :*

Q. If I did not select the grain in one way I did in another. I did not send the men into the field to pick out the largest heads of grain ; but I always got the very best fanning mill, that having the most sieves, and put my grain through it. If I did not pick it by hand I would yet get all the largest grain grown in the field and that was the most rapid and best way of selecting the grain. I hold that that is selection of the very best sort.

The CHAIRMAN.—Before we leave this question is there any other gentleman that would like to ask any questions

*By Mr. Erb :*

Q. What size plots of ground were these tests made upon ?

A. As a rule upon plots  $\frac{1}{20}$  of an acre in size at Brandon,  $\frac{1}{10}$  of an acre at Indian Head ; and  $\frac{1}{40}$  of an acre at the other farms ; on the Guelph farm  $\frac{1}{100}$  of an acre.

Q. My reason for asking is this. I have been at the Experimental Farm and I noticed that there are different beds devoted to experiments on grass and other crops ; and on some beds I would find at certain times of the year there would be, say, one-quarter or one-half of very vigorous plants upon them and others would be very small and puny. The gardener said that the ground was originally very uneven and they had scraped down the soil from the knolls into the hollows and left nothing but the bare sand were the knolls were ; and some of those beds were partly where those knolls stood and the whole of the rich soil had been removed from those spots, consequently the results were very uneven and I can easily understand that the test would vary very largely if plants were located upon plots that were situated as these were. The variety that gave the best results might have been on the best ground and the poorer results would have been produced from the plots which were situated where the knolls had been. That is what makes me ask whether these results were from large or from small plots ?

A. The tests were made on small plots ; the ground was selected to be as even as possible ; and I learned from those in charge that where any part of a plot was damaged or very uneven, it was measured and allowance made for it. On the Guelph farm there is less variation of soil than there is on the farm at Ottawa.

Another thing I want to say is this, that to give the average of yield of crops, when conditions under which they were grown are different, is to place misleading information in the hands of the farmer. That is a conclusion which a leading English investigator has published in his last report. It is like saying, one man in Ottawa is worth a million dollars ; four other men are worth 50 cents a piece ; and the average of the wealth of these five men is \$200,000 each. It is not so. There is no use in giving averages of yields except where the conditions are alike.

Q. Do I understand that at the Experimental Farm at Ottawa, it is known that there are certain varieties that have stood very low in the list, and have done well elsewhere. Do you account for this by saying that the conditions are such that they don't thrive here ?

A. Quite so. Varieties that have stood very low on the Experimental Farm at Ottawa, have in some cases stood high in Nova Scotia and British Columbia and *vice versa*.

*By Mr. McMillan :*

Q. Does not that settle the point that the variety has something to do with it ?

A. I fear I have not made myself quite clear. There is an essential difference in varieties ; but whether any variety will differ from others in the right direction of productiveness in any locality, I cannot know until it is tried there.

*By Mr. Lang :*

Q. According to your theory, grain will not run out ; but can be selected from year to year so as to improve it ?

A. That is right.

*By Mr. McGregor :*

Q. But you want the best to begin with ?

A. Yes, certainly ; and not only the best variety but that from a field in which the crop was heavy. It might take a long time to grade up poor seed ; it is always well to start with the best that is obtainable and then to improve that from year to year by selection.

*By Mr. Moore :*

Q. If you sow any seed without making a selection it will deteriorate.

A. I think if you do so, year after year, it will deteriorate. Everything that is improved by culture deteriorates unless prevented by a continuation of the means whereby it was made better—selection and good soil. Improvement by culture has been effected by constant and successful struggle against tendencies which pull the other way.

Mr. HURLEY.—Wheat with us treated that way by selection never deteriorated ; it was as good the last year as the first.

Mr. McMILLAN.—I stated the other day that Siberian and Black Sea wheat did well with us for 8, 10 or 12 years, and after that they deteriorated. One farmer took them both and removed them about a hundred miles to his father-in-law's place at Hamilton. We could hardly grow them in Huron at all. When he came back with the seed it yielded as well as ever it did.

Mr. HURLEY.—May be your land came up in the interval.

Mr. McMILLAN.—I have always found in selecting seed that you should never go south and take seed north ; go north and select seed and take it south. That is some thing I have watched closely, for I have to watch these things.

Mr. MCGREGOR.—Of course we must always remember that when we buy seed at a neighbour's or at the stores we want the best. If you don't keep sowing the best it must go back.

Mr. McMILLAN.—I believe with the Professor in going into the field if we have time and picking the good seed, and then by passing them through the fanning mill we will have the best. You can only grow large grain from large seeds. I am a firm believer in that.

Mr. McMULLEN.—What the Professor says in regard to grain running itself out unless you select the best seed is the experience of every one who has any knowledge at all of agriculture. On the other hand selecting the best seed and sowing that, is, to my mind, a practice not adopted by farmers as a rule. They do not go through their crops and select the best seed.

Mr. McMILLAN.—Take the fanning mill with the best riddles and though not done by hand the seed is as well selected as you can wish.

Mr. McMULLEN.—The fanning mill does it by the use of wind, but the man by the use of his brains. You get the best heads by going through the field and from them you get the best seed.

Mr. ROBERTSON.—This is a matter exceedingly important for the country,—the possibility of getting ten or twenty per cent more crop by the use of the best seed. The selection by the fanning mill is most excellent. This is what it does : it separates the heavy and large seeds from the others. They give the young plants that come from them a larger store of food at a critical stage of their growth. But some of the large and small seeds grew on the same stalks. By taking the heads of the largest and most vigorous plants in a heavy yielding crop ; and then selecting the large heavy seeds from them by the use of a fanning mill, the double benefit may be secured. The selection by the fanning mill gives the young plants a better chance ; and the selection from the heavy crop and from the heads of the best plants, gives you still better plants to have that better chance from the store of food in the large seeds.

Having examined the preceding transcript of my evidence of May 5th and 9th, I find it correct.

JAS. W. ROBERTSON,  
*Commissioner of Agriculture and Dairying.*



NOTE.—Since the foregoing evidence was laid before the committee, I have received (June 9th) a copy of the “Year-Book of the United States Department of Agriculture, 1898.” It contains an article on “Improvement of Plants by Selection,” by Herbert J. Webber, Special Agent of the Division of Vegetable Physiology and Pathology. I find in it much information on methods of selection which have been used to improve the crops of various plants, particularly cotton and Indian corn. I have taken the liberty (with the consent of the chairman) to submit some quotations. I had not seen it at the time I gave my evidence or I would have pointed out how fully it supports the deductions and recommendations which I submitted.

A diagram illustrating the method of selecting Sea Island cotton which has been successfully applied by Mr. W. A. Clark, of Columbia, S.C., sets forth the plan so clearly that I have copied and modified it, to illustrate what I have recommended for the selection of seed-grain, of wheat, oats, barley and pease.

The following are the quotations. The italics are mine, and the subheadings in italics are also mine.

### I.—*Showing effect of Selection.*

“Selection is one of the most important factors in plant breeding, the natural capacity of all plants to vary furnishing the basis on which the breeder has to work.”

“The largest ears may grow on comparatively unproductive or weak stalks, and therefore to obtain the best results seed corn *should be selected in the field*, and attention given to the habit, productiveness, general vigour, &c., of the plant, as well as to the character of the ear, kernel and cob, and uniformity in ripening. The same remarks apply to the selection of seed wheat.”

“Allen cites an interesting case of increased yield in corn as a result of selection, as follows:—‘Four years ago my foreman, at my earnest request, began the selection of field corn for seed purposes. He grew the white dent red-cob variety. Before harvesting the main crop he went over the field and selected the lowest growing, stocky stalks, with two perfect ears each. He has followed the same plan ever since, with *an increase of fully 25 per cent in productiveness.*’”

“The custom of carefully selecting the seed (cotton) has grown with the industry and may be said to be inseparable from it, and it is *only by such careful selection* that the staple can be kept up to its present superior excellence.”

“These high-bred strains (cotton) are maintained only by continuous selection, and if for any reason the selection is interrupted, there is a general and rapid decline in the quality of the staple. The cotton produced by these rigidly selected plants commands a much higher price than the general crop and is sold direct to manufactures for special purposes.”

“This method and similar ones employed by numerous other growers are applicable with slight variations, to most of our common crops, such as corn, wheat, &c.”

“Increased size and productiveness are among the most common and important features resulting from selection. The increased length and quantity of fibre of the Sea Island cotton, previously described (Pl. XXVI), are good illustrations of this, and *doubtless all common agricultural crops could be similarly improved.*”

“Louis de Vilmorin’s classical experiments in selection, which resulted in increasing the richness of sugar in the sugar beet, shows what exceedingly important results can be obtained by careful attention in selecting the seed-producing plants. These experiments in fact saved the beet-sugar industry of France and established it on a paying basis. His method consisted simply in testing the individual roots to determine their richness in sugar, and selecting for seed production, or ‘mothers,’ as they are termed, only those showing the largest percentage.”

“The percentage of proteid matter in wheat, pease, &c., and of starch in potatoes and barley, &c., could doubtless be increased by similar modes of selection.”

## II.—*Showing effect of change of conditions, such as locality, &c.*

"The variations which form the basis for selection and the formation of new and improved races of plants are the direct or indirect *results of changed environment* or of hybridization and cross fertilization."

"Probably the most common way of obtaining initial *variations* is to select them from seedlings as they appear, but *their advent* can be greatly hastened by artificially *changing the conditions* under which the plants grow, or by crossing different races or species."

"As explained above, hybridization and *changing the environment artificially* are the *principal means* of securing desired *variations*, and selection is the means by which a variation when once secured is augmented and fixed."

"In the words of Henri de Vilmorin, 'Cross breeding greatly increases the chance of wide variation, but it makes the task of fixation more difficult.'"

## III.—*Continuous growing under the same conditions and in one locality.*

"Thus, in selecting wheat or any other plant to increase the productiveness, it is of the greatest importance that very many individuals grown under the same conditions should be examined and the seed taken only from those producing the largest yield."

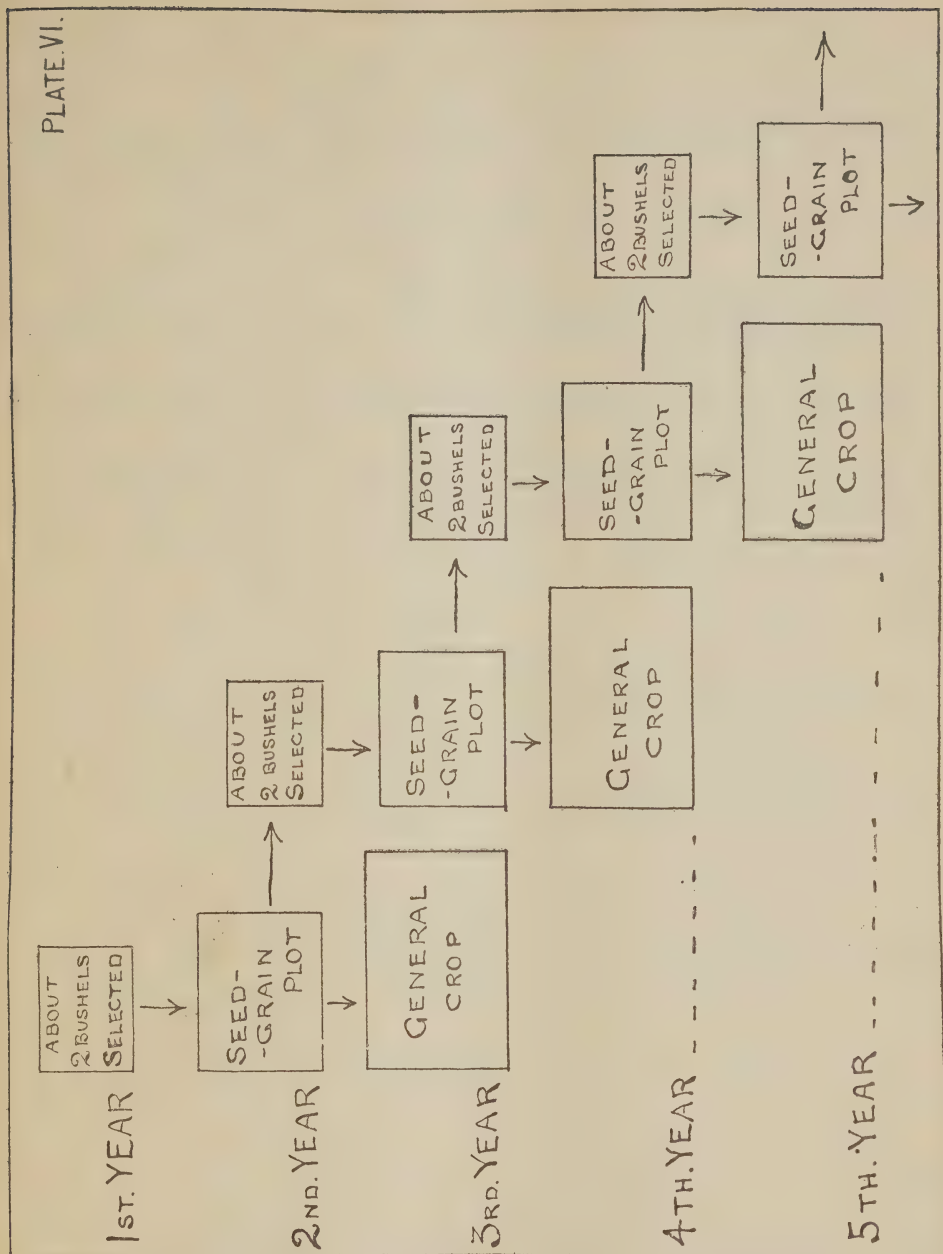
"In selecting with a view to obtaining a sort suited to local conditions of soil or climate somewhat adverse to the best growth of all existing sorts, the plants for selection *must be grown in that location* in order that they may be subjected to the adverse conditions, and *those individuals selected which survive and prosper best.*"

"The uniformity of heading or ripening of lettuce obtained in the forcing business is also, as the writer is informed by Mr. P. H. Dorsett, of the Division of Vegetable Physiology and Pathology, an interesting and valuable illustration of *improvements* of this nature *obtained by selection*. Careful growers of this crop, particularly in the vicinity of Boston, where the industry has reached its greatest perfection, *always raise their own seed*, claiming that it is impossible to purchase seed suitable for their requirements."

## IV.—*Selection as a general agricultural practice..*

"In the preceding pages attention has been directed to some exceedingly valuable results obtained by careful selection methods, for instance, the increased productiveness of cotton, corn, sugar-beets, etc. The common methods of selection are simple and inexpensive and should become general practices in agriculture. Every farmer and horticulturist should devise for each crop a systematic method of selection similar to that described in the case of Sea Island cotton, so that the general crop may be grown continually from selected pedigree stock. All common agricultural crops respond to skilful selection, and in every case valuable results will doubtless reward the agriculturist's attention to this principle."

PLATE VI.



JAS. W. ROBERTSON.



## CHEESE, BUTTER, BACON, FRUIT, FLOUR—PRODUCTION AND EXPORT.

COMMITTEE ROOM No. 46,

HOUSE OF COMMONS,

9th May, 1899.

The Select Standing Committee on Agriculture and Colonization met this day, at 10.45 a.m., Mr. Bain, Chairman, presiding.

Mr. JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying, was present at the request of the Committee, and made the following statements :—

Mr. CHAIRMAN AND GENTLEMEN,—The outside markets for Canadian farm products is a very large subject for one morning ; and as the special agent of the department in Great Britain is here, I shall deal only with the general aspect of the main products in the British markets ; and leave Mr. Grindley to speak of the details of packages and condition of products which he was able to examine while there.

## CANADIAN CHEESE.

Our cheese trade in Great Britain is not in a very healthy state. The increasing wealth of the people there makes them much more fastidious in choosing their food. They have been for some twelve years continuously demanding a softer bodied cheese. Such a cheese cured in a warm climate developes a heated and strong flavour to which the English consumer has a constant objection. While improving our cheese in richness of body we have not been able to retain, in a large quantity of summer-made cheese, the clean nutty flavour. Meanwhile the English and Scotch makers have been making their quality superior, by adopting systematic methods instead of the old rule of thumb practice. During last July we found English and Scotch cheddars quoted in active demand at about 60 shillings per 112 pounds in England, while Canadian cheese was difficult of sale at 42 shillings in the same market at the same time. Let me say that the manufacture of English and Scotch cheese is not a small thing. It is estimated that they make over there about one pound of cheese for every two pounds they import from all countries.

Flavour is due to the curing temperature mainly, cleanliness being observed. When cheese has been cured in this country continuously at a temperature under 65° Fahr., we have had a flavour like English cheddar ; while similar cheese cured in a room where the temperature fluctuated over 75° Fahr. has been of inferior flavour. This has resulted in a difference in value of one and a half cents a pound when the two cheeses were compared in December. The remedy is to have the temperature of the curing rooms in Canada so regulated that the cheese can be cured at a temperature under 65 degrees. The average temperature in England in summer is from 61 to 62 degrees ; and if they have a stone wall curing room they can maintain that temperature inside. We have issued special instructions to cheese factory owners and cheese makers on the methods by which curing rooms can be improved. At a slight expense they can be made so as to have a temperature of 65 degrees. It will then be possible to get a quality as good as they do in England. The department has made arrangements to handle the cheese from two factories one-half cured as usual and the other half in a room kept at 65° by insulation, and the use of a sub-earth air duct, supplemented by ice. I think the cold storage rooms in creameries for butter have accomplished a great deal for that industry ; and I believe a great deal can be done by having cool curing rooms at cheese factories.

*By the Chairman :*

Q. Do you vary the making by that ?

A. You can vary it towards making the cheese softer when they can be cured at a low temperature. By curing cheese at a cool temperature there is quite one pound per cheese less loss in weight ; and the saving in shrinking alone in one year is equal to one half the cost of the improvements required in a curing room.

*By Mr. Featherston :*

Q. Is the cheese made softer by less pressing ?

A. No, it is made softer by heating the curd to a rather lower temperature and stirring it somewhat less. That is a condition that is quite safe when cheese is cured at a lower temperature. In that way you get an increased weight and better quality for the English market.

A. The department has also been in correspondence and consultation with the owners of steamships and they promised this year to provide ventilated chambers on the ships for the carriage of cheese, not cold storage but simply ventilated chambers with fans to carry the warm air out and take fresh cool air in during the voyage. That will cause them to be landed in much better condition, cool and firm with bright dry surfaces.

*By Mr. Stenson :*

Q. What is the temperature in these chambers ?

A. The captain in charge said he thought they could have it down to 60° or 65° by having the exhaust fans run during the nights only in warm weather. Nearly all the cheese shipped from Montreal warehouses are cooled down to 50°. A large part of the cheese handled there go through cool rooms ; and perhaps five-sixths of them are cooled down to 50 degrees.

Q. Does that not hurt the cheese ?

A. It retards curing. The cheese which suffer most from heat on the voyage are the through shipments which pass directly from the railway cars into the steamships.

*By Mr. McMillan :*

Q. Does not the same hold for apples and eggs ?

A. For eggs and for all except the early varieties of apples, cool ventilated storage is better than cold storage on the steamships. The early varieties have not been well carried except in cold storage. All winter apples, when they come out of cold storage into a warm moist atmosphere, deteriorate.

Q. They sweat ?

A. Yes ; there is condensation on their surface. From ventilated chambers the fruit can be landed and marketed in better condition.

*By Mr. Moore :*

Q. What kind of arrangements do you make for keeping the temperature below 65 degrees ?

A. In a cheese factory the curing-room is insulated by being lined inside. I am speaking now of improving a building that is already up. It is lined inside all around walls, floor and ceiling with two thicknesses of paper to keep the warm air from the outside from getting inside. It is then sheeted inside with one thickness of lumber. That makes an excellent curing room that may be kept at a proper temperature with little difficulty.

Q. Do you put lumber close up to the air space ?

A. We use two thicknesses of paper and one of lumber which is quite sufficient to keep the air from the outside from coming through. Of course if you are erecting a new building, I would prefer putting two thicknesses of lumber and two ply of paper

between them, both on the inside and the outside of the studs. That gives a good air space in the wall; and it is a construction that does not cost very much. The curing-room of the cheese factory should have double windows in the summer time.

*An hon. Member :*

Q. Do you use shutters also?

A. Certainly, shutters are also required; and double doors as well. These small things make a great deal of difference, when the temperature is 90° outside.

*An hon. Member :*

Q. How would you cool the atmosphere inside the room after it has become warm?

A. By constructing a subearth duct to be four feet in the ground and not less than 100 feet long, making it of tiles and giving about 100 inches square of opening for every 5,000 cubic feet contained in the curing-room. That is for a small curing-room occupying a space of say 20 ft. x 30 ft. The warmth inside the room will create a suction along this duct; and the air passing at a depth of four feet underground along the duct for a distance of 100 feet will become quite cool. I have cooled rooms very often down as much as 10 and 12 and sometimes even 15 degrees in this manner. The warm air is carried out by a ventilator from the ceiling. In ordinary cooling rooms the draught is so great that sometimes it is necessary to partly close the opening from the subearth duct into the room in order to keep the air from coming in too freely and consequently not cool enough. An ice rack is put along one side of the curing-room and ice blocks are placed upon it. The air circulates down over the ice and by this circulation you can keep the temperature down to 60 or 65 degrees even in exceedingly warm weather. In a cheese factory making fifty tons of cheese per year, 50 tons of ice would be an ample supply for the purpose of keeping the room at the temperature I have mentioned. It does not cost very much, as the ice can be put up almost anywhere in Ontario for 80 cents a ton or less.

*By Mr. Stenson :*

Q. Is it not necessary to have the ceiling as well as the walls covered with paper so as to prevent the hot air coming in from above?

A. Quite so, and the floor also should be lined. The latter is quite as important as the walls. The whole of the inside should be covered so as to prevent the passage of air from the outside into the inside except through the duct. Insulation is not needed to such an extent as in the butter store rooms, because in the cheese factories the difference is as between 60 degrees and the outside temperature; and in the butter rooms the difference is as between 34 degrees and the outside temperature.

*By Mr. Featherston :*

Q. Is not there a danger of getting cheese mouldy by the damp air which comes through the duct?

A. There may be; but by using a small amount of formalin in a glass vessel, and allowing a cloth to hang over it as a wick, the formalin will evaporate into the atmosphere and keep everything free from mould. It has been also applied by spraying the surface of cheese in a cheese factory and has prevented the growth of mould on the surface of the cheese for a time. It has been applied very successfully to the killing of mould.

#### CANADIAN BUTTER.

Canadian butter is making headway in England, with one difficulty and drawback still to overcome. When the butter made in Canada is taken from the cold storage chambers on the ships or the warehouses in Great Britain and taken to the retail shops



it loses its flavour rather quickly. Moisture from the atmosphere condenses on its surface; and the butter becomes what they call in England "winded" which is a serious fault. The butter makers, as far as I can learn, in all other countries from which butter is sent to Britain, use some other preserving substance in the butter besides common salt. The English importers last year have been urging the use of a small quantity of some preserving material to keep the butter in good condition for four or five days in the retail shops, in order that it may please as well there as the Danish.

I made an experiment several years ago and found that butter did not lose its flavour so quickly when a small quantity of preservative was used. The preserving material used was 90 per cent borax (powdered) and 10 per cent of salt. One-half of one per cent of that mixture in addition to the usual salt was sufficient to keep the butter.

Q. I was told it was excluded by law?

A. There have been a few cases before the courts in England, but there has not been a conviction sustained where anything less than one per cent was used.

It seems to be a recognized thing that one per cent is allowed without being regarded as adulteration; and the best authorities hold that it is entirely non-injurious.

The relative position that our butter has already taken with the Australian, is this: In 1895 the Australian butter, compared with Canadian creamery, ranged about from 9 shillings to 13 shillings per cwt. higher than ours. Of course butter fluctuates greatly according to the supply, but on the average the quotations that I can find for a year gave from 9 to 13 shillings per hundred weight difference in favour of the Australian butter.

*By Mr. Featherston:*

Q. That is the Australian butter?

A. Yes. In 1896 it was not so much; in 1897 from 2 shillings and 6 pence to about 7 shillings. In 1898, for part of the year, the Australian butter was from 3s. to 5s. lower than Canadian; and for a part of the year from 2s. to 4s. higher. On the whole last year Canadian creamery butter was a little higher than Australian, whereas in 1895, taking the average, Australian was from 9 to 13 shillings per 112 pounds higher than ours.

Q. What is the cause of the difference; are they shipping more favourably than we are?

A. They did then, because they had cold storage provided by the Government before we had. We have only been shipping in cold storage for four years.

*By Mr. McMillan:*

Q. Are the compartments in their vessels separated from each other or are they all kept at one heat?

A. Everything from Australia is frozen; nothing of ours is. The Australian practice is to keep the temperature at 20° or under, for beef, mutton and everything in cold storage. Ours are carried at from about 34 to 38 degrees.

*By Mr. McLaren:*

Q. Our goods are chilled?

A. Chilled, not frozen. When butter is held for a long time it is brought down as low as 20 degrees.

Then comparing our butter with Danish, we have not come up to where they are; but on the whole we have gained on Danish from 1895 to 1898, about 6 or 8 shillings per cwt. We have not gained to the point where they are; but we have gained that much on them.

*By Mr. Featherston:*

Q. Owing to improved conditions?

A. Yes, owing to improved manufacture ; and also owing to improved cold storage at the creameries. The butter is cooled the day it is made and therefore stays good. That is quite as important as cold storage on railways and steamships.

*By Mr. McGregor :*

Q. Is the Danish butter handled in cold storage ?

A. No, only cool storage ; but it is only from 3 to 4 days on its way to the market.

*By Mr. McNeill :*

Q. What is the difference in price between Danish and ours ?

A. All the way from 4 to 9 shillings per hundredweight ; and in one exceptional case higher than that. In 1895 the difference was in extremes from 14 shillings up to 22 shillings ; but on the whole I do not think our average gain has been more than from 6 to 8 shillings per cwt. on creamery butter.

*By Mr. MacLaren :*

Q. Is it not largely because of the name Danish has got ?

A. A good deal. It is fashionable to eat it ; and it does not go off in flavour quickly.

Q. On one occasion I was given some Danish butter and some Canadian butter to taste. I did not ask which was which, and as it happened I chose the Canadian butter. But for all that the Danish butter was selling at 4 shillings per cwt. more because it had the name.

A. Yes, and Canadian last year improved in the market also because it has so much better a name than it used to have ; people are asking for it in the shops.

*By Mr. McGregor :*

Q. On the whole the market looks better than it has been ?

A. Yes.

*By Mr. MacLaren :*

Q. And also because it is called Canadian instead of American ?

A. There is something in that.

MR. MCNEILL.—I have found the same thing in regard to cheese as Prof. Robertson did with butter. When I was last in the old country I saw English cheddar cheese marked at one shilling a pound and Canadian at nine pence a pound. I took some of both home and had several people try them without letting them know which was which ; and all declared that the Canadian cheese was the better, and still one was selling at nine pence and the other at a shilling.

*By Mr. McMullen :*

Q. Have you anything to say about the putting up of butter ? A great deal depends on that ? What have you to say about the best method ?

A. I think the package most suitable for the export trade is the Canadian box, rectangular, almost square, holding 56 pounds net, covered inside with paraffin and lined with parchment or butter paper. That is the package most preferred.

*By Mr. Featherston :*

Q. And the square loads best ?

A. Yes, they load better in the steamships ; and turn out better on the counters of the shops.

*By Mr. McMullen :*

Q. Better than the round package ?

A. Yes. There is a trade still in South Wales which requires tubs. We leave it to the merchants who are exporters to advise the creamery men what sort of packages they want.

*By Mr. Featherston :*

Q. I suppose you recommend the centrifugal process with reference to creaming ?

A. Yes. The cream is recovered more fully ; and the skimmed milk is left in better condition for calves.

*By Mr. Calvert :*

Q. Have we shipped any butter in pound prints ?

A. The export of pound packages has not been a success. So much surface of butter is exposed that the butter loses flavour quickly. The English dealer likes to get it in bulk ; and then makes it up in pounds or smaller prints himself.

*By Mr. McNeill :*

Q. Is the use of boracic acid becoming general ?

A. Not in Canada ; but the English makers are using it in their own manufacture.

*By Mr. McMullen :*

Q. Are the square boxes put up with screws ?

A. They have dove-tailed corners which are also glued ; and cost about 18 or 20 cents.

Q. Made of spruce ?

A. Yes, they are made of spruce, and are about  $\frac{5}{8}$  or  $\frac{1}{2}$  inch thick, so they are quite light. We have a growing trade, to a limited extent, in butter and tins for the Yukon region ; and we now have several customers in Japan to whom we send regularly monthly shipments from the Government creameries in the North-west. They say it is better than the butter they get from France. We also have a small trade with the West Indies.

*By Mr. Featherston :*

Q. What sized packages do they take ?

A. Two pound, five pound and ten pound tin packages, chiefly two and five pounds.

Q. Shipped in crates ?

A. In close boxes holding about 60 pounds to the box.

In order to have the difficulty of mould removed from the production of the current butter season, I had the following formula recently issued from the Department in the form of a circular for distribution to butter makers :—

“ DOMINION OF CANADA,  
“ DEPARTMENT OF AGRICULTURE,  
“ Commissioner's Branch,  
“ OTTAWA, 22nd May, 1899.

“ TO PREVENT MOULD ON BUTTER.

“ The presence of mould on butter and on the paper and package is a source of injury to the butter. The appearance also is such as to lessen the value very greatly.



"Experiments have shown that formalin is a most excellent preventive of mould. All paper to be used for the lining of butter packages should be soaked in a strong solution of salt. Formalin may be added to that salt brine at the rate of 1 oz. of formalin to 3 gallons of brine. The paper should be left to soak for 24 hours. The same brine may be used continuously. It may be renewed by the addition of a little fresh brine and formalin every week.

"Formalin does not at all preserve the butter and should not be used for that purpose. It should be used in the brine on the paper only to prevent mould.

"The Butter and Cheese Association of Montreal has passed a resolution strongly disapproving of the use of green boxes, that is boxes made of unseasoned wood.

"The paper with which butter packages are lined should not be lighter than 45 lbs. per ream.

"(Signed) JAS. W. ROBERTSON,  
"Commissioner."

#### CANADIAN BACON.

We find Canadian bacon taking very well in the British market, with the difficulty that at certain seasons of the year a percentage of our bacon is rated as being soft, and therefore fetches a relatively low price. There is also a quantity of the bacon rated as seconds; that means that the bacon is too fat, though of good quality otherwise. When in London last year I found from one of the largest handlers of bacon from Canada that in July the range was from 33 per cent to as high as 50 per cent of seconds in some shipments; and the seconds were fetching anywhere from 6 shillings to 8 shillings a hundredweight less than the firsts, that is from  $1\frac{1}{2}$  cents to  $1\frac{3}{4}$  cents per pound less than the firsts. We are going to lose our nearly first position there unless we are able to send a larger percentage of firsts—that is bacon from hogs weighing from 180 to 220 pounds, rather thin in the back, fleshy and not soft. The soft bacon cannot be smoked to look nice on the other side, and is sold for a comparatively low price. It is flabby and does not look well. Experiments have been in progress since last autumn to get some definite light on the causes of soft bacon as far as the causes might be in the feeding and management of the hogs. I am not prepared to make a full statement in regard to that as yet. We have obtained some light through our work last winter, and I think are on the right lines of investigation; but until the experiments have been carried on further it would not be wise to draw definite conclusions. However, I may say this in passing, that where one-half of the food in fattening the hogs has been Indian corn, the hogs have been classed as first quality.

*By Mr. Clancy :*

Q. In what stage of the feeding is that?

A. In the last ten weeks.

*By Mr. McMillan :*

Q. I have heard a man complaining that they have more soft bacon than ever before?

A. Yes.

I looked into the question in Essex last autumn. My way was to get the evidence of the men who are in the business. The practice in the western part of Ontario where a large proportion of soft bacon came from was to grow the young hogs in inclosures, feeding them mainly on Indian corn and finishing them off on pasture where they get plenty of clover. The inevitable outcome of that practice was soft bacon. On the other hand, where the growing hogs are reared in pastures and finished off on a ration of half corn, there has not been soft bacon.

*By Mr. Clancy :*

Q. Does that arise from the corn or might not some other grains produce the same finish ?

A. They might.

*By Mr. McMillan :*

Q. Suppose you finish off on all corn ?

A. That makes the bacon very fat.

*By Mr. Calvert :*

Q. What other grain do they feed ?

A. A mixture of barley, pease and oats.

Samples of soft bacon and firm bacon were obtained from a well-known packing house and transferred to Mr. Shutt, chemist at the Experimental farm for examination and analysis. This was established by his investigations : That there is much less connective tissue in the fat parts of the hogs that are soft than in the hogs that are firm. Connective tissue is doubtless formed while the animals are growing ; and if that structure is not formed while the hogs are getting their growth, the probability is that the bacon will be soft.

*By Mr. McMillan :*

Q. Have you any experience of hogs fed on roots ? Where we are living the increase of hogs is enormous and most farmers are feeding largely on mangels ?

A. That would give the conditions for making firm bacon. For all these things fed to young growing hogs make for the robustness of life.

Q. There are three farms where they have been sending over every month one or two loads of hogs fed largely on mangels and the result has been very good.

*By Mr. Clancy :*

Q. It does not seem quite clear yet, whether soft bacon may be traced to corn or any other grain when the finishing in both cases would be clover ?

A. No, that is not demonstrated. A point that is demonstrated is that insufficient nutrition while the animals are growing is apt to produce soft bacon.

Q. Why do they object to feeding corn in connection with whey all the time ?

A. I do not know, except that corn and whey do not make a well balanced feed.

Q. The corn and whey make the bacon firm ?

A. Yes ; but too fat.

Mr. McMILLAN.—I have paid much attention to the growing of young hogs, and I let them run around ; for my experience is that when allowed to run around they grow better. I have always fed the different varieties of grain, and I believe that it will be borne out that the corn makes the best bacon.

*By Mr. Cargill :*

Q. In order to get the information, whom do you consult, the hog producer or the hog curer ?

A. I consulted both ; and the opinion of the packers is that corn makes soft bacon. When I consulted farmers I found that when some corn was fed it made the bacon first class. They have an opinion in England which I think is founded on experience, that the want of connective tissue was caused by insufficient nutrition while the hogs are young.

*By Mr. Stenson :*

Q. Do you not feed them with clover first ?

Mr. McMILLAN.—We feed them on clover and they did first class on it when they were young, when we took them in to make them up before selling them, we took them off the clover.

*By an hon. Member :*

Q. Do pease make more tissue than corn?

A. Pease make an exceptionally firm bacon. A mixture of pease, oats and barley is very good.

Mr. GILMOUR.—Through Essex and those western countries last year was it a common practice that pigs reared around the farm yards on corn were then turned out and sold from the pastures?

*By Mr. Featherston :*

Q. That was the time of the year that soft hogs came in?

A. All the way up west they shipped fresh from the clover fields. That is the time we had most trouble with soft bacon in England.

*By Mr. McNeill :*

Q. If the farmers had not a large supply of skimmed milk to feed them, if they were obliged to feed whey, for example, whether would corn or pease be most likely to give the best results?

A. Pease and whey make a better balanced food than corn and whey.

*By Mr. McMillan :*

Q. Do you mean that for fattening them for the market for a short time before you are selling?

A. Pease, oats and barley are much better than corn to be fed with whey.

*By Mr. Kaulbach :*

Q. Is corn liable to cause hog cholera?

A. No; but speaking generally, I found that wherever there are such conditions that the young pigs are not vigorous and thrifty, those conditions cause any disease in the locality to be more rampant.

Hon. Mr. FISHER.—I believe that one of the chief things to be watched is that during the growth of the hog you must give flesh-forming food and not fattening food; and it is very important that during the period of the hog's development you should give food that gives them connective tissue. If you once lay the foundation of good bodies, I am satisfied that your bacon is not likely to be soft. If, during the growing period of your hogs, you lay a foundation that is soft, you can never overcome that; and from that you will not be able to market good firm bacon. But if you have the growth of the hog properly made, you can afterwards feed him whatever is necessary to fatten him up to the point when he is fit for the market, and you will have good firm meat.

*By an hon. Member :*

Q. Supposing you feed on clover?

Hon. Mr. FISHER.—During the growing period clover is very good food. I don't think clover alone would do. You would have to give them some grain as well, when you are fattening them. I have known a good many hogs that were grown on clover and were afterwards fattened properly that gave good firm bacon. If you tried to finish them up on clover the experience is that the bacon would be soft.



*By Mr. McNeill :*

Q. It does not do merely to lay down the connective tissues you must take care that you do not feed afterwards something that would have a contrary effect?

A. Yes. I think you may spoil the hog afterwards even if the foundation is properly laid ; but if you do not lay the foundation well I do not think you can ever remedy it.

*By Mr. Semple :*

Q. How does the price of Canadian bacon in England compare with that of bacon produced in other countries?

A. Last summer, and in this also you have fluctuations in the markets, there were small quantities of Canadian bacon selling about as high as the best Danish. A good deal of Canadian was selling at from 2 to 4 shillings per cwt. under the Danish ; but all the way from 6 to 15 shillings above the United States bacon, which was of a different character. Canadian bacon was not so high as the best Irish, which is better than the Danish.

*By Mr. Moore :*

Q. Do you say that it would be possible to fatten hogs up to say 400 pounds and have the hams as fine as with the young hog of, say, 150 pounds. Will it make as saleable an article as the small ham?

A. I do not think it would be so tender or as good ; and it would cost much more per pound to produce the heavy hog.

#### CANADIAN FLOUR.

The other matter I thought of bringing up this morning is Canadian flour and its place in the British market. We have a large export trade in flour. In 1898, up to 30th June, Canada exported flour to the value of \$5,425,760. It is no inconsiderable trade. Looking into the question in England so far as I was able in the limited time at my disposal, mainly in London, I found the bakers did not know Canadian flour as such in hardly any case, but where they did know it they spoke exceedingly highly of it as a good strong flour, good for mixing with other flours and giving good bread. The English bakers make up their sponge from seven or eight kinds of flour, so as to have a continuity of quality in case one brand should fail them in the market. Just before leaving Canada for England I got a sample of the best Hungarian flour, brought from Hungary by a gentleman in the milling business who was passing through there. This was examined by the best experts and they established that Canadian flour contained 10 per cent more of albuminoids (flesh-forming qualities) than the best Hungarian. I went to a prominent baker in London to see if there was any possibility of having a test made by using Canadian flour in one of the modern bakeries. The test was made, but not under government authority or auspices. It was done by the bakers themselves for their own information. This reliable firm of bakers furnished me with a report afterwards. One of their tests in using Canadian flour gave the rate of 146 pounds of bread from 100 pounds of flour, and that of excellent quality. They got at the rate of 152 pounds of bread from the next test and 151 from a third. All of these were from our strong Canadian flour. The point is this, that there is no other flour going to England from any country, so far as I can learn, that makes as much bread per 100 pounds, or as good bread as Canadian flour.

*By Mr. Featherston :*

Q. That was from Manitoba wheat, of course?

A. Yes, and if the excellence of its quality were known in England generally among bakers, it should increase our exports.

By Mr. Semple :

Q. Don't they import wheat into England more than flour?

A. Yes, the millers prefer that, but there is a large export trade from Canada in flour.

By Mr. Kaulbach :

Q. How did the quality of bread from Canadian flour compare with that made from American flour? Was that tested?

A. We did not test American flour against Canadian ; but as far as there is any evidence, American flour from the North-western States is about the same as our Manitoba flour ; the American flour from other quarters is like Hungarian, and has more starch and less gluten.

Q. That would naturally give a good deal less bread?

A. Yes, and of a less nutritious quality.

The following table shows the value of some of the produce of Canada, exported during the year ending 30th June, 1898 :—

THE PRODUCE OF CANADA.

—		Quantity.	Value.
			\$
Cattle.....	No.	213,010	8,723,292
Sheep.....	"	351,789	1,272,077
Hams.....	Lbs.	86,911,090	8,092,930
Butter.....	"	11,253,787	2,046,686
Cheese.....	"	196,703,323	17,572,763
Poultry and game.....			100,736
Eggs.....	Doz.	10,369,996	1,255,304
Wheat.....	Bush.	18,963,107	17,313,916
Flour.....	Brls.	1,249,438	5,425,760
Oats.....	Bush.	9,876,463	3,041,578
Oatmeal.....	Brls.	176,821	554,757
Pease.....	Bush.	3,236,131	1,813,792
Apples.....	Brls.	439,418	1,306,681

The following summary of the exports of all agricultural produce and of animals and their products from Canada, shows the value of those which were exported to the United Kingdom and the United States respectively in the three years 1896, 1897 and 1898 :—

ANIMALS AND AGRICULTURAL PRODUCE (THE PRODUCE OF CANADA).

Value: Year ending 30th June.	Exported to	
	The United Kingdom.	The United States.
	\$	\$
1896.....	40,694,222	6,173,875
1897.....	45,825,601	7,090,647
1898.....	66,227,923	5,054,853

The evidence I have gathered the last few years in looking at our foreign markets goes to prove that the United Kingdom is the market for the surplus of farm products of Canada.

## THE APPLE TRADE.

COMMITTEE ROOM No. 46,

HOUSE OF COMMONS,

16th May, 1899.

The Select Standing Committee on Agriculture and Colonization met this day, at 10.45 a.m., Mr. Bain, Chairman, presiding.

Mr. JAMES W. ROBERTSON, Commissioner of Agriculture and Dairying, was present at the request of the Committee, and made the following statements :—

MR. CHAIRMAN AND GENTLEMEN,—The Canadian apple trade is not in a good way in Great Britain. The unfortunate position over there is due to one of two causes, and in some cases to both. One of these causes is the lack of care, the lack of skill, and the lack of honesty in packing the fruit, and the other is in the damage sustained by the fruit in its carriage from the place where it is packed to the place where it is sold. Looking first at the last difficulty, that of the want of safe carriage for apples, I observe only this that during the last two years the department has represented to the steamship companies the desirability and need of providing ventilated chambers for the carriage of apples on the steamships. It does not seem possible to carry apples safely across the Atlantic unless the holds in which the apples are placed are provided with efficient ventilating apparatus. Apples generate heat, and when placed in a warm atmosphere generation goes on more rapidly. And so we have asked all steamship lines to provide against this by carrying in cool air by ducts in the bottom of the holds and sucking out the warm air by electric fans from the top of the holds. All of the steamship lines said they were quite favourably disposed to do this, but a great many of them did not do it. The few lines so equipped seem to have carried apples much more safely than the others in the few ships so equipped. I need not read the letters sent to the steamship people, first in the autumn of 1897 and again last year, but our whole endeavour in that regard has been to induce the steamship companies to provide accommodation that will be safe for the carriage of apples. The contrast between the conditions in which all kinds of fruit was landed last year from Ontario and from Nova Scotia is most striking. This was called to my notice very emphatically by Mr. E. D. Smith, one of the largest fruit growers in Ontario, and also reported on by Mr. Grindley, who was our agent in Great Britain and saw how things were on the spot.

Mr. Smith writes as follows :—“ As I know you have somewhat interested yourself in the matter of shipment of our apples to Great Britain, I wish to draw your attention to a most important matter that I discovered this fall. I may say first of all that I am on a committee appointed at the fruit growers' meeting. I presume it will present itself to advance this argument to the ship-owners in Montreal—in the meantime I thought I would write you and show you what could be accomplished by a system of ventilation, even only imperfect, as it seems to me this is, of the Halifax boats. I am mailing you a bundle of sale accounts of apples in Britain during this fall—one of them you will notice on the outside of the bundle by W. Dennis & Son, Covent Garden London, shipment of about 1,000 barrels shipped by Halifax city; you will notice these apples are from a great number of different shippers, consequently it is fair to presume that the packing of the apples has nothing whatever to do with the carrying of the apples in good shape for the old country. It is not at all reasonable to suppose that fifteen or twenty different shippers selected at random from the farmers of Nova Scotia



would put up apples in better shape than 15 or 20 experienced apple packers in Ontario would, and yet you will see that although these apples are from so many different shippers, in the whole 1,000 barrels there are only 14 barrels reported slack and wet whereas in any of the other catalogues you take up you will see the percentage of slacks and wets runs from 20 to 75 per cent on every line of boat leaving Montreal. \* \* \*

"Did you ever realize that the carrying of the apple crop of Ontario to Britain sound and uninjured, as it could be carried without any serious extra expense, would have meant to the farmers of Ontario during the past ten years very many millions of dollars. It seems to me that it is the greatest economical waste in any branch of industry with which I am acquainted.

"Here are given two of the conditions of a permanent and lucrative trade. We grow the best apples that are supplied to the British market—the British people, or I may say, the people of the Continent of Europe, want our apples and appear to want them in ever increasing quantities—here are two essential conditions necessary to trade, the other condition, that of safe carriage of commodities we have always been lacking in, and for lack of it our apple growers have become discouraged. For when there was the best and finest crop of apples in Ontario that we ever had, and in a year, too, when farmers had poor crops and were getting low prices for their grain, the apple crop was virtually a non-paying one on account of the low prices the farmers were obliged to take, and these low prices which were unprofitable were produced on account of the miserable condition in which apples arrived in Great Britain, not only that year but in previous years."

With that letter came a bundle of account sales of last fall which accorded so thoroughly with this that Mr. Smith inclosed them to me. I made a careful summary of them which I will give to show the condition in which our apples arrived in England, not a few barrels but in large lots. Dealing first with that lot of Nova Scotia apples, all that is on the one set of account sales, sent by 43 shippers and sold in London. There were 950 barrels sold as tights, 5 barrels of slacks, and 9 barrels of wets. Last year the conditions in Nova Scotia were much more favourable to having a uniformly good crop of apples than in Ontario, because the conditions in Ontario were unusually bad. Nova Scotia apples are sold in Great Britain as Nova Scotia apples and not Canadian apples—that is Canadian apples are apples from other parts of Canada, and Nova Scotia apples are always sold as Nova Scotia. Mr. Grindley will also make plain the difference in the size of barrels.

*By Mr. Featherston :*

Q. That is a good report.

A. Yes, excellent, and Nova Scotia apples have not been always given that. Letters attached to Mr. Smith's communication show that the steamship by which these apples were carried had thorough ventilation.

*By Mr. McGregor :*

Q. Had the vessel cold storage or ventilated chambers?

A. Ventilated chambers ; cold storage is not used for carrying apples except the early tender sorts. A low temperature is rather a detriment as they get damp and wet.

*By the Chairman :*

Q. This was among the late shipments of apples ?

A. Yes, about October.

*By Mr. McMillan :*

Q. Would there not be something in piling apples up to sweat ? Many people pull them and allow them to sweat well before packing ?

A. All three things go to affect our apple trade, want of care, and want of skill and want of honesty in packing, as well as want of proper means of carriage.

Taking the shipments on Canadin apples, last fall, which are Ontario mainly, a few perhaps from Quebec, sold in Liverpool by two different sets of salesmen; taking a quantity of 14,416 barrels going by 17 different steamships and sent forward, as near as I can make out from the brands, in about 185 different lots, the brand is sometimes so much like another brand that it may have been the same—but that is a very wide range you see of data from which to make a calculation. There were nearly 15,000 barrels on 17 steamships sent forward in 185 different lots. The account sales show this that out of the total quantity there were only 5,928 barrels sold as tights. There were 2,793 slacks, 2,446 slightly wet, 1,997 wet, and 1,252 wet and slack. That is to say rather more than one half of the apples shipped in these lots were sold as slack, slightly wet, and wet. The difference in price realized by these apples is very great. The only way to get any fair information on this is to take a lot of apples sent by one ship and pick out the apples of the same class sold as tight, and the others of that variety sold as slacks or wet. Going over the list and taking out the apples of the same variety under these conditions the slacks on the average sold for two shillings and seven pence less than the tights. The slightly wets, for three shillings and eight pence less than the tights, the wets for seven shillings and three pence less than the tights, and the wet and slacks for nine shillings and eleven pence less or nearly ten shillings and of these wet and slacks there were 1,252 barrels.

Q. That would hardly pay the cost of handling.

A. That would not pay the price of freight.

*By Mr. Featherston :*

Q. How much was paid for the good apples?

A. They averaged 16s. 5d. a barrel.

*By Mr. McMillan :*

Q. On whom does the blame for this rest?

A. The salesmen in England as a rule blame the slackness on the conditions of the apple when packed and the method of packing, and the packers in Canada blame it on the methods of the salesmen, but we have not yet been able to find out the truth.

Q. I believe a good deal of it is due to the packing, and that the difficulty is that the different dealers have different methods of packing. Some men packing apples have a larger proportion of slacks in some barrels than in others with the same quality of apples.

A. That is all I have to say on the subject of apples.

*By Mr. Featherston :*

Q. You started out by saying that the two salesmen in England report to you. Was there any difference in the sales?

A. There was no appreciable difference in the proportion of slackness. The figures stand nearly uniform for both salesmen and this agrees with the information that has been got in a more general way by watching the market from week to week.

*By Mr. McMillan :*

Q. Is it stated, what condition the apples are in when they become wet? Have some become wet while others did not in the same vessel and the same compartment?

A. These in each case came out of the same compartment and were out of the same lots. Take this case for illustration. There is a shipment by one steamship, of the brand "choice XXX." There was in this one lot of Kings, 13 tight and 12 slightly wet. Then in Colverts with 23 tight and 20 slack. And then there comes a lot of

Colverts with 23 tight and 17 slightly wet, so that all through the same variety there seems to be different qualities.

*By Mr. Carscallen :*

Q. And some apples were not in good condition in all of these shipments?

A. Every time there were some slack. Out of 123 shipments there was not one shipment whose apples were free from slackness.

*By Mr. Clancy :*

Q. Is there any difference in the percentage of slackness in different varieties?

A. A little bit, but the evidence is not very clear on that. Kings seem to carry more safely than others. A very firm apple seems to have a less percentage of damage than all other varieties.

*By Mr. Featherston :*

Q. Don't you think that the less waste in the Kings is due to the superiority of the apple in the market?

A. Sometimes we notice, even in the Kings, that when you have a lot—take that case of tights and slightly wets—the slightly wets were sold at the same price as the slacks. The classification of conditions seems to have been made before the sale, and the buyers will pay almost the same price for a slightly damaged apple of a good keeping sort, while some other varieties will go down to five shillings.

*By Mr. Moore :*

Q. Have you the figures of the quantity exported and the value last year?

A. I have not these figures here now.

Q. Who are our competitors there now?

A. Competition comes mainly from the United States and a little from Australia.

*By the Chairman :*

Q. Have you any information as to how American apples reach the market. Are they more careful?

A. On this same account of sales there are sales also of apples from the United States, and I do not find any appreciable difference between the percentage of slacks and wets in the shipments of their apples and ours. The Nova Scotia apples have a far better name in England than the Canadian apples as such, and sell for a far better price, although the barrels contain 25 pounds less apples.

*By Mr. Clancy :*

Q. There were some trial shipments made by the Department I believe?

A. There were a few boxes of tender fruits but not any of apples. As to apples imported into Great Britain, in 1896, I have not the figures for 1897 at hand, but I can get them, the value was \$7,700,000.

*By Mr. Moore :*

Q. That is the total value imported into England, can you give us the value imported from Canada?

A. Yes, of that total value of \$7,700,000, Canada sent \$3,145,141, that was our large year, in 1896. The United States sent \$3,271,582, and France, Australia and Belgium were not very far from each other, of about \$380,000 each.



*The Chairman :*

Q. Then the chief trade is from Canada and the United States ?

A. Yes.

*By Mr. Featherston :*

Q. Do you not find that our apples sold higher than those from the United States and other countries ?

A. Not in these shipments. Other apples sold fully as high as ours.

There are two points I would like to mention. I would like to give you this instance of evidence that came in an unexpected way as to the necessity of care in packing, because I am sure we have a great opening in Manitoba and the North west for Canadian apples, if they can be delivered there at reasonable prices and in good condition. The superintendent of our cold storage building at Calgary, last year bought a barrel of Canadian apples for himself. The apples had been shipped from Ontario, and he said that he had just the same experience as others there with Canadian apples. There were two rows of good apples at the ends of the barrel, and the rest was filled with windfalls and other poor apples. He writes that, unofficially to the department from Calgary, and states that others there have had the same experience with our apples. That brings me to make the next statement which is, to my mind, a more difficult and deplorable condition of things than even the apples being landed in a damaged state for want of safe transportation facilities. This is a letter that came to my department in March of this year. It is from the ex-mayor of the town of Yarmouth, Nova Scotia, and is addressed to the Hon. Minister of Agriculture. The letter is as follows :—

“DEAR SIR,—I beg to call your attention to a matter which, to my mind, deeply affects the honour and trade of Canada ; your department being specially concerned. As doubtless you will know the steamer ‘Castilian,’ from Portland for England, with cargo of cattle, cheese, pork, apples, &c., was wrecked upon Gannet Ledge and became a total loss. Many goods were saved, dry and in perfect order, others wet and badly damaged. The apples dry and wet were sold in Yarmouth. These apples were from Ontario, marked ‘choice selected,’ various kinds, also had in many cases the names of the packer. I have in my possession the names of several packers and their place of residence. But, sir, the ‘choice selected’ apples, to our disgust, at the gross deception were, for the most part, mere wind-falls, and but fit for feeding. Three or four top courses in the barrels would be fair ; the centre but wind-falls and nubbins. I could but think of the sad effect upon the apple trade, you and all of us are so anxious to see flourish, would have been the result had this cargo of apples reached England and been placed upon the market. Signed, Joseph R. Wyman.”

From that cargo samples were sent showing the end rows in the barrels and the fillings in the barrels. (Mr. Robertson produced a large apple about four inches in diameter as a sample of the apples which were upon the first two courses of each barrel and the second apple about an inch and a half in diameter as a sample of the filling for remainder of the barrel.)

If this were an exceptional case last year, I would not have felt myself justified or altogether warranted in bringing it before the attention of the committee, but it agrees with so much that Mr. Grindly reports as the results of his personal observations in the English market last year, that I think it is right, in the interests of the trade and of the reputation of Canada, that this thing was known just as it is. Last year, I think was an exceptionally poor year in Ontario for getting good apples. On account of the weather a large number of them were damaged and poor but we sustain the most serious loss and injury in our whole apple trade for want of having our packages marked so that the contents are true to name and description. If we are to get the name we would like to have, and ought to have, we must pack our fruit so that the marks on the barrel will be accepted by buyers with confidence, and we will get good prices. An Englishman getting a barrel of that kind of apples referred to by Mr.

Wyman will give our apples the cold shoulder for years afterwards. That is how we suffer because of this manner of packing.

*By Mr. McMillan :*

Q. You would advise that all the best apples be packed in one barrel and the next best in another, the marks on the barrel indicating the quality of the apples all through the barrel. That in my experience is the best way, and I find that where apples were packed that way, they did better than when they were mixed up?

A. I would recommend two things especially to all packers of apples; to exclude entirely all damaged apples and then to carry out the suggestion of Mr. McMillan as to sizing their apples thoroughly, even if it has to be done by a sizing machine, with paste-board screens. These screens bring the apples out in three different sizes and the work is done without injury to the apples in any way. The fruit looks nicer and those that are sized in this manner bring the shipper an enormously greater value than if he put all sizes of apples promiscuously in one barrel.

From Cobourg I had a letter from a firm of apple shippers, E. Leonard & Sons, saying: "I am a fruit grower as well as a shipper, and I have the best cold storage building from Toronto to Montreal, yet we have had very heavy losses this winter on account of frost. If your department would take this up and get us heated cars with a building of some kind to protect the fruit at Portland and other shipping points from frost, that is what we want. The cars could be run to this building and kept there in safety until the vessel is ready to receive them. I have known instances where apples lay three weeks at Portland before shipping, and have a report from Wood, Allan & Co., of Liverpool, where they say that apples were frozen in the bottom of the ships; having never thawed out from the time they went on board. Talk about selecting and careful packing and all this, but there is no use in trying to put up a fine article and then have it frozen before it is put on board the vessel. I put up my apples in two grades, nothing but the very best in the first grade and in some cases rather poor in the second grade. Yet I have an account sales for one car of spys from B. Crossly & Sons, of Liverpool, where our second quality of apples brought three shillings more than the first, all on account of the small apples carrying better than the large fine ones. This early fruit spoken of is only a trifling matter in comparison with the late shipments. I would recommend heated cars the same as they use on the Canadian Pacific Railway, and some protection at shipping points for the loaded cars till the vessel is ready to take them."

Now from the cold storage inspector who was stationed at St. John last winter to facilitate the rapid and safe shipment of butter from St. John; in one of his reports I find this regarding the steamship "Labrador;" "She had a large lot of apples and some of them were or had been frozen before getting here. I saw one barrel opened in the shed and the top ones had been frozen. They were nice large apples, Northern spys. The Canadian Pacific Railway agent told me that there had been two barrels opened and that they were both the same."

That is from our own agent, saying that he also had seen frozen apples. Then there is the representation forwarded from the London Chamber of Commerce conveying the views of the green fruit and vegetable trade section of that body on the question of the condition of apples delivered ex-Canadian steamers. It was addressed to the Right Hon. Lord Strathcona, and is dated from Botolph House, Eastcheap, London, 14th March, 1899. The communication is as follows:—

"MY LORD,—At a recent meeting of the above section the question of the condition of apples delivered ex-Canadian steamers was discussed.

"It was stated that many consignments arrived in a plundered and damaged condition, a considerable number of packages being only half full. This is a great hardship, both to the shippers and the consignees, neither of whom have any means of redress, inasmuch as the steamship companies are protected by the clauses they insert for the purpose in the bills of lading, thus evading responsibility.

"As the Canadian lines are heavily subsidized by the Canadian government, I was directed to call the attention of your Lordship to the matter and to express the hope that it may be possible through your influence to ensure that the steamship companies will cause greater care in future to be taken in regard to consignments of apples, with a view to the plunder and damage complained of being stopped.

"I was further directed to call the attention of your government to the excellent system of inspection which I am informed is adopted by the government of Victoria and other Australian Colonial governments who take steps to see that all consignments are passed in good condition when shipped, and to inquire whether a similar system could not be adopted in Canada. It is believed that the adoption of such a system would materially contribute to the development of the Canadian fruit trade of this country by giving it a good name and reputation for reliability.

"I am further informed that it is easy after some slight experience to judge of the quantity and contents of a package by the amount of rattling which takes place when it is moved about. A full package gives no sound but partially empty packages disclose their condition on being moved. I shall be obliged, therefore, if you will kindly lay the views of the section before the Canadian government."

That latter, which is signed by Mr. Kenrie B. Murray, the Secretary, refers not merely to the damage sustained from wrongful or poor packing and from the lack of good facilities for carrying the apples safely, but to the damage to the packages containing them in handling and the abstraction of part of the contents. Then we have representations from a large number of fruit growers' associations in different parts of Canada recommending that an inspector be stationed at the different ports to see that the apples are well placed and that the holds are properly ventilated.

*By Mr. McLaren :*

Q. Would they also inspect these apples before they are put on board? Suppose a man is shipping 500 barrels of apples, if two or three were opened and inspected in that way this man would be afraid to ship poor fruit if you had some law to prevent them going on board?

A. There is a very large and difficult question there.

Q. If you could stop these going across and injuring the Canadian apple trade or compel the man to sell them for improperly packed fruit or according to brand—instead of going to work to try to send them forward as first class—I should think they could be stopped by the inspector?

A. Well if some standard was established and a man wrongfully branded his apples we might get at him. But otherwise a man in the common usage of the country should be allowed to ship his own property. Then I wish to mention that such a system of inspection as would prevent badly packed fruit going forward would involve a great expense, because it is not sufficient to open the end of a barrel, because in England a barrel is opened and emptied out on the floor and the apples are sold by that sample.

Q. Why not have that done here?

A. It would mean a necessary delay of a couple of days in shipment and a good warehouse in which to carry on the inspection.

*By Mr. McMillan :*

Q. You cannot do that because those on the top will be more or less damaged and would have to be renewed with others?

A. Yes, and when a barrel is emptied out like that it is impossible to pack it again.

*By the Chairman :*

Q. Shippers tell me that the greatest difficulty in that way is the delay in shipping caused by an inspection?

A. There is just evidence to this extent that the apple growers themselves are doing their interest great damage, either by packing apples carelessly or dishonestly or



allowing some one else to do it, when they have grown the apples, and then there is the injury to the trade from damage done to apples on the steamships, and occasionally on the cars.

*By Mr. McMillan :*

Q. You will find apples occasionally on steamers loaded too near the boilers, and that spoils them ?

A. That is so.

*By Mr. Rogers :*

Q. Is it compulsory that shippers must stamp the barrel ?

A. No, only this, that the English law requires that all fruit products shall bear the name of the country from whence they come.

Q. Would it not be a safeguard if a packer's name was obliged to be stamped on his barrels ?

A. Most of them do.

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Having examined the preceding transcript of my own evidence I find it correct.

JAS. W. ROBERTSON,  
*Commissioner of Agriculture and Dairying.*

MR. A. W. GRINDLEY,

Special agent of the Department of Agriculture in Great Britain during 1898, was called, and in response gave the following evidence before the Committee:—

MR. CHAIRMAN AND GENTLEMEN.—Prof. Robertson touched on the point of our apples in England being classed as almost from two different countries, that is the apples from Nova Scotia and Canada. Even a paper like the *London Times*, in speaking of the Christmas apple trade, says, “Because of the short quantity of choice English apples the imported samples, especially from California, Canada and Nova Scotia, have made good prices.” That has been brought about by the barrels largely. In Nova Scotia they use a sawed stave barrel and split hoops, with very large bilge, almost straight staves, which holds from 100 to 120 pounds of fruit net. The so called Canadian barrel used in Ontario and Quebec has a smooth stave, flat hoop and considerable bilge and holds about 140 to 150 pounds net. The Ontario barrel is superior to the Nova Scotia one, which is very rough and unsightly, so it is not on account of the barrel that Nova Scotia apples sell better and rank better than the so called Canadian fruit.

About the way the fruit is graded (I am speaking more particularly of Covent Garden, because the London market is more particular than the Liverpool, Bristol and Manchester markets, it is the most particular market in Great Britain) on the London market, California comes first, Nova Scotia second and the so called Canadian fruit takes third place. Now Californian fruit has only attained the high position it holds because California sends forward a uniformly good article.

*By Mr. Bain :*

Q. You are speaking only of apples now?

A. I am now confining myself to apples wholly.

The Californian Newton Pippin was retailed on the London market for a dollar a dozen. As far as the apple goes, we have far better apples in Canada than the California Newton Pippin.

*By Hon. Mr. Fisher :*

Q. About what dates would that be?

A. It would run in for the Christmas fruit trade. It would be in the month of December last, the forepart of December.

Nova Scotia ranks ahead of Ontario and Quebec for the same reason, although they do not rank as high as regards packing fruit, and are not as uniform as regards size as the Californian; they are away ahead of Ontario and Quebec, that is taking it as a whole. There are exceptional cases in Ontario and Quebec where they ship fine apples. Just to show what is being done, there is the case of Mr. Shepherd of Como, who is shipping over our Canadian snow apples “La Fameuse” packed in a box something like our egg cases. These apples never go on the general market at all. He sends direct to the Prince of Wales and the Army and Navy stores, London. If we send apples like that we can compete successfully with the California Newton Pippin, because although a pretty apple that looks well on the table, as regards flavour and eating quality it is not in it with many Canadian apples.

TOO MANY VARIETIES AN INJURY.

Nova Scotia has got up a reputation for apples from the Annapolis Valley, the Ribston Pippin, and the Gravenstein. There cannot be a greater mistake than shipping too many varieties of apples. California has got a reputation worked

up on one variety. I am told they confine their shipments to about four varieties. Nova Scotia sends a considerably larger number than that, but when you come to Ontario and Quebec the number is much larger. Going down Covent Garden market one morning on one side of the market I jotted down the different varieties of Canadian apples. There were 40 different varieties from Ontario and Quebec alone. I have here a statement in reference to a shipment of apples that was sent from Bowmanville, Ontario. In a consignment of 69 barrels there are 16 different varieties. The English like a uniform article, and when they send in repeat orders, they want to have these orders filled with the same varieties and about the same grades that they got in previous orders that gave satisfaction. It is a well known fact that as soon as other countries, Denmark and the United States, adopted creamery methods and we went on with dairy methods, our butter trade went from bad to worse, until we adopted the creamery system, and sent large quantities of a uniform article. California has got the market by sending large quantities of the same varieties, the Newton Pippins; Nova Scotia sends chiefly Gravensteins and Ribston Pippins, confining the trade to a few varieties. As for the so-called dishonest packing, I do not know that the farmer is altogether to blame because having so many different varieties—and we have in Ontario some 80 standard varieties of apples; you go into the ordinary farmer's orchard, and if he has forty trees, 10 to 1 he has ten varieties in it. He has so many kinds that when he goes to pack his apples he has not enough of one variety to grade his apples properly, but has to put in large and small apples in order to make up the shipment.

Another great objection to the Ontario and Quebec trade is that they have too many early varieties at a time when the market is glutted. In the fall of the year large numbers of early varieties are rushed on to the markets, the market is flooded. These apples have not good keeping qualities, so that later on in the season there is really a scarcity of apples. You take our Canadian markets to-day and you will find they are selling apples out of cold storage down in the townships at 30 cents a dozen. Two important changes can be brought about. By top grafting, in good keeping varieties we can do away to a large extent with a large number of varieties, both in old orchards and new orchards, the difficulty has been brought about by apple tree agents to a great extent. The agent comes around with a book showing a lot of pretty cuts of apple trees and he says to the farmer, "here is a good apple," and the farmer takes a sample of each variety. Graft in varieties well adapted to the British markets, good keeping varieties, and then the farmer having a large majority of good keeping varieties, is better able to grade his fruit. I might say that this case that I have mentioned is not an exceptional one. I have gone down Covent Garden market noticing the Ontario and Quebec apples, and you will often see just such instances as that, (Referring to the exhibit put in by Prof. Robertson) not in such a state of rot, because these have been exposed and handled for some time, but I have seen apples sent over there graded "A No. 1," in packages that had wormy and spotted apples in them.

#### PECULIARITIES OF MARKET TOWNS.

In Covent Garden market, the buyer, before making a bid on any Canadian fruit is bound to see a sample of the fruit, but I have seen samples of fruit from France and California where the brands and names on the packages are so well known and reliable that they are a guarantee of the quality of the fruit. You see such names as Block and Meek of California, and the buyers never think of opening their packages. The grades and marks outside are sufficient to let the buyers know what the contents of that box are, but you do not find them buying Canadian fruit that way. They will not take the marks of XX, or 4 X, as the case may be, on the outside of those parcels of Canadian fruit, but insist upon having a sample of it. Here is a sample and it is not an exceptional case. A man in Montreal made a very true remark when he said that the men who ship seem to want to spoil the reputation of the whole country, or something of that kind. You will see very inferior fruit at auction stall after auction stall on the Covent Garden market, and even worse in the markets of Manchester, Bristol and Liver-



pool, for the reason that the London market is more particular about the quality of the goods than the other markets are. You see very little Nova Scotia fruits on the markets of Manchester, Bristol and Liverpool. London does not care about the size of the package, it is the quality that they are after. The other markets want large barrels, and Ontario and Quebec apples come to Liverpool, Manchester and Bristol markets because of the fact that they are packed in large barrels. I have seen barrel after barrel of Canadian apples on the Manchester market in which there were large quantities of small apples that were not better than this (indicating a small apple)—apples that farmers would look at twice before they would pick them up to feed in their pig pen. But they are learning their lesson. I know of a firm that bought a large quantity of apples in Montreal during the glut in the market, and they shipped them over to Bristol and sold them there and they lost a thousand pounds sterling on the shipment, and I was not surprised at it either, on account of the quality of the apples they shipped.

*By Mr. McMillan :*

Q. Supposing you top-grafted would you get enough fruit of good quality from the same stocks ?

A. My own experience from top-grafting is that you will get good fruit and true to kind, and I prefer top-grafting to root-grafting for the reason that I think we get much better results. I have tried top-grafting into old seedling orchards where the trees bore apples which were perfectly worthless, common seedlings.

But the nature of the trees was very hardy, and by top-grafting the trees pruning and cultivating the orchards, we have succeeded in getting good apples. We have any quantity of such old orchards in Canada which by cultivating and top-grafting may be made into good orchards which will produce profitable crops of apples in a shorter time than by planting new orchards.

*By Mr. Featherston :*

Q. Is it not a very great drawback for the Canadian apples that the sellers have to show samples of each variety before the buyers will purchase them. Will there not be loss as a result ?

A. Yes. When the barrels are opened and the fruit turned out there is more or less damage done to them, and they bring inferior prices in consequence. They are sold as samples then. Time and again in Bristol, I have seen just one or two barrels of a variety and of course the buyer wants to see a sample of each variety and that is the drawback, but when you get on the London market with the Nova Scotia fruit you see thousands of barrels of Gravensteins and Ribston Pippins and California Newton Pippins in cases, but when you strike into a lot of barrels of Canadian apples you may begin to look for all sorts and sizes. There is no uniformity about them, and that is what the English market calls for, uniformity in the size and quality. There is a sort of feeling amongst the English people that they are willing to give a fair chance as far as possible to the colonies and to colonial fruit. There is a feeling that all things being equal they prefer Canadian or Colonial over the foreign article, and colonial fruit of all kinds would get the preference.

#### NOVA SCOTIA APPLES.

Unless we have a radical change in the methods of packing and shipping apples the Canadian fruit is going to take a back seat. The Nova Scotian apple has the preference, because there are men down there whose names and brand are so well known on the Covent Garden market to-day that they are accepted by the buyers and I know of men that have the reputation of being first-class men in Canada, who have had packed bad fruit, spotted and wormy, and put them into boxes as first-class fruit. It may have been the best quality that he had, but we must have some sort

of standard to grade our fruit by, either by size or by quality, because if you come to put what is called an A No. 1 Canadian, beside any No. 1 California, they are found to be different articles altogether. We have a grade for Canadian wheat, and we must have a standard for our apples and grade them up to it, and ship only apples up to the standard. I will say just a word in regard to packages. Unless you have some very choice desert apples it pays better to ship in barrels, the expense and freight is too great to send it forward in small boxes. We have, but we have not been using it very much, a box the inside measurements of which are 22 by 11½ by 10 inches deep. They hold about 50 pounds of fruit, but there is a box that Mr. Sheppard is using which is very fine for export, it is being made in Canada now, that is a box with cardboard partitions, it is supposed to hold about a bushel and a quarter. The spaces are made in different sizes so that you can grade your fruit, and choice apples are being sent over in very fine shape that way. It is rather expensive because the packages cost about 40 cents each.

#### PACKING AND TRANSPORT OF PERISHABLE PRODUCTS.

Now, within the last few years it has been advocated to use the ventilated barrel. I have spoken to a number of men on Covent Garden and they do not approve of it. There are several faults which are found with it. Suppose you pile them up six or seven deep. These ventilated barrels are liable to get bent down, and as apples won't give like oranges they get crushed down and bruised. Another thing is this: take apples which arrive in a hot dry time and they are liable to become shrivelled, and if they are landed during cold weather they are liable to be injured by frost or even by sudden changes of temperature. That brings me to another point where we are wrong in all fruit shipments, and that is the packing of the fruit while it is warm. If you go to California you find that the fruit is all cooled down before packing. The idea of the ventilated barrel was that when the apples were packed up within a few days and put in cold storage, the apples would cool down, which was perfectly correct, but the point seems to have been lost sight of that when they were taken out of cold storage the heat would get through into the apples as readily. Take the moving from the cold storage warehouses or cars to the ships in Montreal. The apples are exposed to great heat for a short time. Then they are cooled to a temperature of 36 degrees, and all these sudden fluctuations act in an injurious manner on the tissues of the fruit. It is just the same as if you take meat and freeze it and then rapidly thaw it; you are going to injure it. Take it in our soft-skinned fruits, such as plums and tomatoes, which are taken out of cold storage with nothing more covering them than tissue papers, and expose them to a temperature of 60 or 70 degrees, and in a day or two they will melt away. The tissues are ruptured, and it works just the same using ventilated barrels. So the idea would be to cool the fruit before it is packed.

*By Mr. Featherston :*

Q. And pack in tight barrels?

A. Yes, pack in tight barrels.

*By Mr. McMillan :*

Q. And then it should go across in ventilated compartments?

A. Yes; I will touch on that point in a little while. Up to within the last few years we shipped in ordinary holds, and as the apples were with other perishable things without any ventilation, heat was generated from the mass of perishable food products and it spoiled the apples. Then we went to the other extreme and adopted cold storage and put the fruit in there. That acted better than the other plan, but still the sudden changes from a temperature of 35 or 38 degrees to a hot moist atmosphere, as in England, caused the moisture to condense on the outside of the fruit when the barrels were opened, and you had everything suitable to start up rapid rotting. Last year some apples taken from cold storage when opened up appeared to be in magnificent con-

dition. In 48 hours they had settled down 6 inches in the barrel and in a week I think it would have been impossible to find a sound apple. These were a soft variety of apple and they went like wild fire. We see the same thing here. If you take apples out of cold storage and put them in a warm atmosphere they will very soon show signs of decay. I was talking to a man in the city of Sherbrooke last week, and I saw that he was asking 30 cents a dozen for apples. I asked him how they came to be so dear and he said "when you don't get more than a bushel of good ones in a barrel you must sell them at a high price." I saw grapes which were taken out of cold storage for the Easter trade and which came out nice, but in a couple of days if you were to take them up by the stem they would all fall off. The Grimsby people pinned great faith on cold storage, but the way of it was that they sent the fruit down to Toronto, there it was taken out of cold storage when wanted and eaten immediately and was all right. But let them try it out here with the same conditions they have in England—taking the fruit out of a temperature of 35 or 38 degrees and putting it into the store show window where the sun is blazing on it all day—and see how long it will last.

Now, as Prof. Robertson says, the steamers are going to have ventilated holds. I think that will be the most satisfactory system we have adopted yet, that is, to have a system of fans to work during the day, but if the weather is very warm to work only during the night, to pump the warm air out of the holds and replace it by cool air. By adopting that method, and by picking, grading and packing the fruit properly, and sending only a few varieties, it will have a tendency to bring about a better state of affairs.

Q. Might it not be well to stop the fans two or three days before arrival on the other side and so bring the fruit to something like the temperature of England?

A. Approaching England the fans would be pumping in the air in which the fruit would land. There is no cold storage about it.

Q. I had a letter from a gentleman who ships fruit and eggs and he found that they had to stop the fans a couple days before they got to the other side, so that when the fruit and eggs got there they were at the same temperature as the atmosphere?

A. But it is not cold air that is in the holds; it is a system of ventilation. I understand what you mean by your question. They have found that taking eggs out of the cold storage the moisture condenses on the outside, and now they are printing on cases of eggs that they are not to be opened until two days after they are removed from cold storage.

*By the Chairman:*

Q. Do they not do that with all cold storage products: bring them out gradually?

A. No. It is done with meat to a large extent by some of the best cold storage buildings in London, which have what they call defrosting compartments, which are used where meat is frozen solid—it is found that it takes four days to freeze a quarter of beef—it is defrosted by the use of dry air and gradual raising of the temperature. There is a system of steam pipes along the floor and pipes from the ammonia plant overhead. The temperature is gradually raised from 24 or 28 degrees to a temperature of 58 degrees. As the frost comes out it is carried up and is frozen on to the cold air pipes overhead, so that at the end of four days the frost has gathered all around these pipes and the meat is as fresh and bright as if it was killed the night before. That is a patent process, patented, I believe, by Sir Hugh Montague Nelson.

Q. That is not used for eggs?

A. No, the only thing that has come to my notice is that some shippers are pasting notices on boxes of eggs that they are not to be opened for two days after they have left the cold storage warehouses.

*By Mr. McMillan:*

Q. In the case of some eggs which were shipped last summer in cold ventilated compartments they stopped working the fans for one or two days before landing and



the eggs landed in the best condition. Mr. D. D. Wilson, went to Montreal and got a compartment to suit himself in one of the Allan line steamers. I had a letter from him stating that it was a success, and he has been shipping eggs ever since the beginning of the trade in Canada.

A. Well, speaking about eggs there is one point I might speak of although it is not a question that is before us to-day. The cause of a great many of the eggs getting a peculiar nasty flavour, a musty flavour, has been brought about by the cardboard fillings. These are sent out from the mills in a green condition. They are made from pulp and a moldy growth starts on them, so they tell me in Montreal, these papers should be dried for a year at least or kiln dried, but that one little point of using green fillings has, in a great many instances been to blame when the blame has been put on the cold storage in the vessels.

Prof. Robertson I believe touched on the fruit market in the West. Year before last when I was out in British Columbia, fully four-fifths of the fruit in British Columbia and as far east as Winnipeg was American fruit. Now there are two reasons perhaps for that. First the excessive freight rates, for fruit shipped from the East, but another reason is, that Ontario and Quebec people do not ship an honest article compared with the California fruit. You see the California fruit on your markets here in Ontario, and in Ottawa and it is graded strictly.

From what Prof. Robertson said of those apples sent out to Calgary it is very little use our trying to work up a market against the United States, in that section of country, until we send them a well graded article of fruit. There we have a market when we can ship satisfactory fruit from Ontario. Ontario can ship fruit as far as Calgary. There is a small section around Vernon where Lord Aberdeen has his fruit farm where fruit can be grown successfully, but there is not any reason why Ontario should not hold the market as far as Calgary at least. But they have got to change their methods of shipping fruit for that market just the same as for the English market. With regard to inspection I quite agree that there ought to be some system of inspection but it is a very difficult thing to arrange. In California and in the Mediterranean fruit districts they have large quantities of fruit which are handled by the same company or the same individual. They get such large quantities, that, having a reputation to build up they do their own grading. In Nova Scotia there are people who handle large quantities of fruit and send packers out, and the same thing is done to a small extent I believe in Ontario and Quebec, men buy orchards of fruit, paying so much for the fruit on the tree, so the farmer may pick the apples and leave them in piles and the packer comes in and grades and packs the fruit. Take a section like Grimsby or the Niagara fruit section, they might have fruit houses there the same as they have in some of the Mediterranean sections where fruit is sent in in large quantities, and then have it packed there under the supervision of an inspector. But I think it would be almost unnecessary to have an inspector if we had the same system of packing that they have in California or the Mediterranean, because there men have a reputation to establish and they are going to do the thing honestly just for the sake of their reputation. But so far as inspecting fruit, say at Montreal is concerned, it would never be a success. If a man say, consigns 500 barrels and he didn't have more than two varieties you might have some system by an inspector taking out a barrel here and there and examining it. But when you have 60 barrels of apples and 60 varieties you cannot expect that, because it means taking out the apples right there and seeing if the barrels are honestly filled. The only way I can see is to adopt something of the same method they have in California and the Mediterranean. That is, let our large fruit men in each section organize together and establish a packing warehouse where they can put their fruit in, have it cooled down, do their grading there and even have the government officer inspect it and put a stamp upon it, as they do in Australia. In the London market you see rabbits coming in with lead seals on the crates put there by the government inspector. The Australians won't allow any rabbits to be sent unless they are fat and of good size. Wines come over there from Australia with the government certificate and so with lots and lots of things. Canned goods all come under a system of inspection.

*By the Chairman :*

Q. Do they ship many apples ?

A. No, they do not. In fact, I am told there is no reason why Canada should not look towards Australia for a market. They have a good market there.

*By the Honourable Mr. Fisher :*

Q. Do they not get some apples from Tasmania ?

A. Lots of apples come from Tasmania.

*By Mr. Hughes :*

Q. Is there not a market in Tasmania for Canadian apples in the off season ?

A. Yes, in the off season there would be, for their season is not our season and we might extend what we are already doing to a small extent. That is a system of branding "Canada" or "Canadian" on our products. We are doing that on our cheese and bacon. I will give you an idea how that works.

I went into a store in Bath where I saw a notice in the window, "Mild cured Canadian bacon." I went in and asked the clerk if that bacon came from Ontario. He said : It did. I then asked him what town in Ontario it came from. He said : "I do not know. I will ask the master." He went into the back shop and came back and said it came from Chicago. I said "Chicago ! Why, that's not in Ontario," and he said : "Oh, yes, it is." That was all I wanted to know. We have established a name for mild cured Canadian bacon on the British markets. Chicago as a general thing has very salt meat. The Englishman has a prejudice against salt in a great many things. This firm had got hold of Chicago bacon and there was not a demand for it, but there was a demand for mild cured Canadian bacon and he was selling it as Canadian. If we had "Canada" on our food products things like this could not occur. The Canadian if he is any kind of a Canadian at all he is not going to brand Canadian on a thing he would be ashamed of.

But there are just a few other points I would like to refer to, where the Government, I think, can do some good practical work for the farmers. That is in giving them practical instructions as to the pruning, grafting, spraying, picking and packing. The Government has talked about establishing illustration stations for the growing of grains and different kinds of farm crops. But I think if they would send expert men into every fruit section and have notice given, public notice posted up that the man is to be there on a certain day for the purpose of giving the farmers instruction by practical illustration, the farmers would come in from that vicinity and he could give them lessons upon these subjects, at the proper season of the year for the various work to be done. Take grafting for instance, which is a very simple thing and can be learned by any one, and a great many farmers would soon be able to pick it up so that they could do their own grafting, and they would do it better probably than it is done by some of the professional men who go around. Then take the subject of spraying. Just before the proper time for doing this work they could go around and show them how it can best be done, teach them the preparation of the mixture. I believe that has been done already.

Then there is picking and packing. I believe that experts could give the farmers a few practical lessons in that department. There was another point brought before my notice in the state of Vermont, and I think it would be a good way for the Government to reach the farmers.

The practice at the experimental station of Burlington, Vermont, to which I have alluded, was a very simple and a very effective one and dealt with the question of spraying of potatoes for the rot. They issue a card with a cut upon it of a potato patch on the top, one-half of the potato patch had been sprayed with the Bordeaux mixture and the other half had been left unsprayed, and the cut showed very clearly in the appearance of the two halves of the crop, the benefits and the advantages to be derived from spraying. Not only was there this picture but there was also underneath a

receipt of how to prepare the mixture, and under that a description of how and when it should be applied. These cards were sent around to every post office a few weeks before the necessity would arise for spraying the potatoes. Now, the post office is a place where every farmer will go three or four times a week, and he sees it hung up there about the time that his potatoes get touched, and he has been looking at it and has learned the advantage of spraying before the necessity arises for using the mixture and when he needs it he knows just what to do.

They had a law for preventing the catching of trout under a certain size, and they issued a card giving a cut of the exact size of fish which was the smallest size allowed to catch, also giving information as to the fine which any person is liable to for taking a fish smaller than the size shown. There was the object lesson before every one, the same as in the case of the potato patch and the benefit of spraying. Now, in Canada if we make any change in our mail regulations each postmaster is furnished with a card setting forth the changes, and it is hung up in the post office and everybody knows of it immediately. Let the Department of Agriculture have a card printed giving information regarding the bulletins that are issued and the nature of the subjects treated in them and where they are to be obtained, so that any farmer who wants to get any information on any particular subject can see where to write to in order to get the bulletin or report upon the subject in which he is interested. These cards can be posted in the post offices throughout the country, and then nobody will be to blame if every farmer does not get the information which he requires and which will be of assistance to him. There might also be some cards such as I have described upon the spraying of fruit trees and other similar subjects. In some cases it would be a good thing to have cuts of apple trees showing one-half the tree that has been sprayed and the other half that has not, and there might also be cuts showing the apples graded the same as I have described, as an object lesson to the farmers, as they should be when they are sent to the English market. Put these cuts upon cards and send them around to different post offices in the country sections, and by that means you can convey a great deal of valuable information to the farmers and keep the question of grading and packing properly before their eyes continually, especially at the season when it is necessary for them to bear it in mind in packing their fruit for the market and shipment.

The season is here now when the apple trees ought to be sprayed. The farmer sees the caterpillars and he knows that there ought to be some spraying done, but he says to himself I don't know where to get the information or what department to write to at Ottawa to get the bulletin giving me the information what to do and how to do it. But if these cards were posted up in all the post offices, containing the information "spray your trees on such and such a date and mix up your preparation for spraying in this way," he is going to put into practice the knowledge that is contained in the information.

Mr. McMILLAN.—There is just this in Ontario, there are few farmers who go to the post office once a week. It is generally the children who go to the post office and bring the letters home. I would just say that the bulletins of the Ontario Government go to every one that is a member of the farmers institutes and has his name recorded on the list.

Mr. HUGHES.—I would like to ask for an explanation as to how to pack the apples. When in the old country I found the greatest complaint was the way they packed apples in Canada. I was not in at the earlier portion of the meeting so I do not know whether that question has been discussed.

The CHAIRMAN.—We have been looking very closely into that matter. Here is an example of graded selected apples from Ontario that were taken out of the "Castilian."

Mr. GRINDLEY.—Mr. Chairman and gentlemen, I will just run over some general conclusions which I have arrived at on points for the Canadian apple shippers to watch.



## HOW TO SECURE PROFITABLE SALES.

The first point is quality which includes (a) soundness, we do not want soft dry mealy apples but crisp juicy fruit, the English people do not like soft dry mealy apples. Quality also includes (b) keeping qualities (c) appearance, that includes size, shape and colour, and (d) flavour.

Ship only good reliable fruit of well known varieties.

Quality is of more importance than quantity.

Quality commands the market.

Quantity drugs the market.

The next point is as regards packing.

Pack honestly.

Grade fruit according to size and colour.

Pack tightly.

Pack very choice table varieties in boxes holding about half a barrel.

A nearly straight staved barrel is best, as barrels with a large bilge are flattened when piled five or six deep, while straight staved barrels rest evenly on the hooks.

Don't brand the growers' name on barrels, as barrels are used the second time, but print the name and address on the felt paper circle which is placed at the top and bottom of the barrel. I may say with regard to that circle that it was a matter which was brought up by one of the largest Covent Garden merchants, in writing to a Nova Scotia shipper, that is, taking ordinary felt building paper and making a circle to go in at the top and the bottom of the barrel, with finger holes in it at each side so as to get the fingers in to take it out and thus prevent tearing. The object of that is to stop the bruising of the fruit at either end and stop the moisture ; and when you open the barrel and that felt paper is seen to be dry it is a guarantee that the contents are dry, while if that felt paper is wet you look for trouble right away. Another advantage of that felt paper circle is, that by stamping your name and address on it you get a reputation for your fruit. If you stamp the name on the barrel perhaps your reputation is going to be hurt by some one else using the same barrel and packing poor fruit in it. But if you stamp on the felt paper circles your name or brand, they will become the means of advertising your fruit.

Brand on the barrel or box the variety, grade, net weight of fruit, or number of fruit, and the private mark of the exporter.

The British markets call for a crisp juicy apple, so do not ship soft and mealy varieties.

If the fruit shipped in large packages and of choice quality is partially damaged, it often repays to pack the best in smaller cases, especially for the London market, which is more particular regarding quality than other markets.

Do not force apples out of season on the British market ; for example, do not force winter varieties on the markets when the demand is for early varieties. The British merchants do not buy in large quantities to hold in storage.

The British markets prefer the coloured fruit. Use only new boxes or barrels for export trade. Do not leave apples on the tree too long, but pick them when the apple begins to get its colour. Do not pile fruit in orchards but cool it and pack as soon as possible. I might say that is a matter that has done great injury, this practice of picking the fruit and leaving it in piles in the orchard till the men come along to pack it. It takes all the nice crispness out and it never comes back again. A lot of these dozey, mealy apples come from their being put in a pile and leaving them there a day or two before packing them.

*By Mr. McGregor :*

Q. The horticulturist says that growers may pile them for a week or two to sweat, which is the contrary to what you say, so it is just a controversy.

A. That is a point which has been brought before me by Montreal shippers and people over there, who claim that the softness of many of the apples is brought about by leaving them on the ground ; that the right method is to pick the fruit and place on trays or shelves in cellars or fruit houses and leave it there to cool. It is also improper to pick the fruit from the trees and pack it in barrels and leave them there. You have to go between the two extremes.

Mr. McMILLAN.—I believe the right way is to bring in the apples and let them stand in the barn some time before packing them.

Mr. GRINDLEY. Do not ship apples with too long stems ; the stems should be cut off to prevent them injuring the other fruit ; but do not pull them off for that will cause the apple to rot. You will see the stem causing a nasty mark when the apples get crushed together in the barrel, so you should cut them off with shears or something of that kind.

Fruit growers with old orchards should observe the following points : Prune, if required, graft with standard varieties for which there is a good demand, fertilize, spray, and give plenty of room to your fruit so that the sun can get in. Gentlemen, this is all I have to say this morning regarding apples.

*By Mr. McLaren :*

Q. What grades of apples do you recommend ?

A. For apples to grow ? I have here a list of the varieties that have been given both by Nova Scotia and Montreal dealers, and apples that have an established reputation. The apples for Southern Ontario for general markets are Kings, Gravensteins, Cranberry Pippin, Roxbury and American Golden Russett, Northern Spy, Baldwin, Greening. Now there is quite an assortment, ten in all, but if a farmer finds that any particular variety is well adapted to his district, then keep to one or two, and you get good fruit. Orchards near cities can grow Red Astrachan and Duchess of Oldenburg. The apples of Quebec and Ontario general markets are the Wealthy, Fameuse, McIntosh Red, Winter St. Lawrence, Canada Baldwin, Canada Red, Golden Russett, Ben Davis, Greenings, Seek no Further, Kings and Cranberry Pippins. These first four, if they are very choice, can be shipped in boxes for table use.

*By Mr. McGregor :*

Q. Is the Ben Davis good ?

A. The Ben Davis I have sometimes seen good.

Q. It is a good apple ?

A. A good apple.

*By Mr. Featherston :*

Q. A good shipper ?

A. Yes.

Apples for New Brunswick, Nova Scotia and Prince Edward Island are Ribston Pippins, Gravensteins, Kings, King Tomkins, Northern Spy, Greenings, Russets, Blenheims, Nonpareils. Of course there are other varieties, but what I want to impress upon the farmers is to confine themselves to very few varieties.

*By Mr. McMillan :*

Q. In keeping apples do you prefer a dry or damp place ?

A. I should not have it either way to a large extent. I should not want it too dry to shrivel the apples or too damp to spoil them. What you call an ordinary cellar or root cellar is a good place. You want a certain amount of moisture but not too wet.

Q. We have two cellars, one dry and the other moist. The apples we put in the moist cellar did much better than those in the other one. Let me cite one experience of a former member of this House in Hamilton, Dr. Springer, who had 70 barrels of

apples in a damp cellar ; it came on a large flood and his barrels were half way up and some of them over their heads in the water. He thought they were destroyed, but when the water went away he found that those were the best apples he had. The barrels were not tight and all the water left them.

A. That was a curious experience.

*By Mr. Cargill :*

Q. What is the best mode of cultivating an orchard to get it in a proper state to make the trees most productive.

A. In some sections they set out the trees 33 to 35 feet apart ; then you have the chance to cultivate the ground around them, and when they are full grown there is not much distance between their tops. In some orchards you find trees set 18 feet apart and when they reach their full growth the limbs become interlocked, and so the fruit does not ripen properly. With plenty of room as we have in Canada we should set them far apart and then they get a chance to spread out.

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The Hon. SYDNEY FISHER, M.P., Minister of Agriculture, addressed the Committee as follows :—

I think the matter we ought to consider most in connection with this information is the relation with the foreign markets. It is not so much a question of how to grow apples which is a separate subject of itself, the question is how to deal with the apples in business,—the commerce of them—and there are certainly several points which are most important. I may say for the last year I have had so many complaints sent to me, as Minister, from all parts of this country and from the English market itself, that I felt it was a matter of the very utmost importance to investigate and get at the facts and lay these facts before the country. Last year there was some exception taken by members of the Committee as to statements of the way in which the apples were packed. It was stated that it would injure our trade and it was said that if these statements went abroad and were circulated through the press, it would create a bad impression. I am satisfied that view was entirely wrong, and it was better to recognize the facts and where there is a difficulty to try to remedy it and not shut our eyes to it. The condition of affairs in the traffic in our apples in the last season has been so disastrous to the apple trade in Canada that it is best for us to recognize it and try to remedy it. The stories of Mr. Grindley and Prof. Robertson are in no way exaggerated. During the last season especially, partly because our apples were grown badly through the season being a bad season, we have had sent forward to England apples that have disgraced this country. Hundreds and thousands of barrels have been sent there dishonestly packed, and this system of work has got to stop or our Canadian apple trade will be ruined, and it is no use blinking the facts or shutting our eyes. The English buyer and public know it and they won't buy our apples unless we send an honest article.

*By Mr. McMillan :*

Q. If we had an inspector would that improve it ?

A. That subject has been brought to my attention, and demands have been made that we should have an inspector at Montreal and the other points of export. I confess that I see so insurmountable difficulties that I shrink from attempting it. There is only one way to inspect barrels of apples, and that is to turn them out. If you turn them out you cannot get them back into the barrel again, and loss occurs. It would be an interminable job when you think that in the fall of the year 300,000 barrels are shipped from Montreal, and sometimes half a million barrels have gone out. You can realize what it means when you think that all these would have to be inspected within eight weeks, and what a job it would be. I have, during this last fall, when in England with Prof. Robertson, interviewed the ship owners in regard to ventilated chambers for



apples. We found we could do nothing with the agents of the companies in Canada, so we interviewed owners of the Elder-Dempster, Thompson, Dominion and one or two other lines in England, and urged them to take the necessary precaution to ventilate the holds properly, not only for apples but for cheese, by putting in ventilating fans which would exhaust the warm air. They promised this, and in some instances in some ships this was done last fall, and I am satisfied that the change was in the interests of the trade. This will remedy that evil to a very considerable extent. I may say this, judging from several shipments sent from Nova Scotia of which we know in ships so ventilated and which reached England in far better condition than any shipments had ever done before, and I am satisfied a great deal of difficulty can be prevented in that way. If Parliament grants me the funds asked for this coming season, I propose to see that we have an officer of the department in Montreal, St. John and Halifax especially charged with the shipping and loading of our apples, and seeing that they go forward in good shape. I think the magnitude of the trade will justify this expenditure, and I think it will be done and will accomplish a great deal of good.

The next difficulty is a much greater one, and that is the difficulty regarding the quality of the fruit itself. Our people have got this in their own hands. If our people choose to grow good fruit and put only the best quality in one barrel and the second best in another, and reject the third best they can establish a reputation in a very short time. A gentleman in Nova Scotia has shipped in the last three years 500 barrels of apples and out of all these he has received complaints of only one slack barrel, and the average net profits over all expenses for his apples have been \$3.50 a barrel over all expenses, commission, freight, etc., and only one barrel was reported as slack. That is a case where a man had taken pains to sort and pick carefully with result of having fine profit. The other apples which he rejected he sold locally either for cider or for the local market. Some people will say that he did not get as much as if he had sold all his apples, about 700 barrels, for the export trade and got a less price. I do not believe that, and I know as a matter of fact men who are doing that do not net as large a profit as he did. The question of Government inspection and grading of the apples at the port of shipment has been discussed. I confess I do not see the possibility of doing it on any satisfactory basis. I would be glad if it could be pointed out how to do it in a satisfactory way, but so far I do not see my way to manage it. There are differences of quality in different seasons, in some seasons there is a large number of good quality, and other seasons we do not have so much. Different varieties would have to be inspected. If in every shipment there were only barrels of one variety a certain number would have to be opened. But with a variety of apples every barrel would have to be opened. The question of Government inspectors is a very difficult one to deal with. Have I any right to say to a man who wants to ship something "you shall not do it." I do not think that the Government or the Parliament has any right to do that. During the time two years ago that there was a discussion on the Act introduced to amend the General Inspection Act, I received shoals of letters from all parts of the country, from everybody engaged in the trade, pointing out difficulties in the way of such legislation as this, and I confess I was frightened from undertaking it.

*By Mr. Featherston :*

Q. In 1892 or 1893 you established a standard apple barrel and according to the experience which we have had here to-day that barrel is not what is required for the trade.

A. It is a barrel which the trade does not like to use and the Nova Scotia part of the trade have refused and do not use it. I went down there this winter and met the fruit growers there and several of their associations in the Annapolis valley, and they simply said they would not have anything to do with the standard barrel, but they asked that we should change the law and make their barrels the standard.

*By Mr. McGregor :*

Q. Is their barrel a larger barrel than ours?

A. No, it is smaller, and it is a straight barrel with very little bilge, but our reports indicate that this year the Nova Scotia apples have been infinitely better carried and graded than the western apples. You take a barrel with a bilge to it and lay it on its side and put two or three other barrels on top of it, and the pressure of the weight of the other barrels elongates it so that there is a space at each end and perhaps that is the reason for the fruit becoming damaged. But the difficulties in the way of Government inspection seem to me to be insurmountable and I would rather try and bring the effects of the present system before the people, and get them to realize how great profits can be realized by the men who really do succeed in properly packing their fruit to meet the requirements of the English markets. It has been suggested that we will have to have the business done in this country in a different way; that the apples should be shipped by large packers, who would buy them in the orchards and take them in and pack them, and I have no doubt whatever that if a system of that kind were established it would have been in the end better for all concerned, but in this country we have amongst the farmers a very strong prejudice against the middleman and these buyers and packers would be laid open to the charge of making too much profit out of it, and a large number of the farmers would not consent to sell their apples in that way. I think myself that the business in other trades is trending in that direction. Take for example we have the bacon and pork trade established in this country on that basis. It has been done by large packing houses who by doing their business in a careful systematic manner have succeeded in establishing the reputation of our bacon and hams in European markets, and it is doubtful whether that reputation could have been established in any other way. So with our butter and cheese trade. It was only when butter and cheese were made in the factories in a large way that the reputation of these products was established abroad. I am inclined to think that anything almost that we export will have to be handled in a large way so that the reputation for the excellence and uniformity of our exports may be maintained and established and probably the apple trade would be benefited by such an agreement. But in the meantime there is no such arrangement perfected.

In the Annapolis Valley probably two or three men handle two-thirds of the whole crop. They buy the apples in the orchard, sort, grade and pack them, and they have been doing the best of this trade, and it is largely due to their care in handling and packing them that the Nova Scotia apples have done so well, and have brought them so much profit in the European market. I have a letter here from Messrs. Watson & Phillip, which Mr. Murray, our immigration agent in Glasgow, has forwarded to me, and I will read it for the information of the committee, as it is strongly in confirmation of what has been said by Prof. Robertson and Mr. Grindley upon the question of packing. The letter which Mr. Murray incloses is from one of the largest firms of importers in Dundee, and it is as follows :—

“We regret to say we have found grave cause for complaint in regard to the quality of the shipment of Canadian apples. The fault consists of dishonest packing, the apples at the top and at the bottom of the barrel being far better than the bulk of the fruit within the cask. This has been very noticeable this year, more so than ever before in our experience and so grave as to cause almost a deliberate swindle.”

He goes on then to suggest Government inspection and stamping, but he points out the difficulties to which I have alluded.

“Of course this will entail the examination of each parcel of fruit, and one barrel probably out of 50 would require to be opened and turned out, and on such examined barrels there would be a reduction in value no doubt, but in the interests of honest packers in America who are prevented from getting the proper value of the goods owing to the general depreciation caused by this dishonest method as well as in the interests of receivers here, there is evident need for such supervision and official stamping. Second quality of fruit of course would bear secondary brand, third quality the brand indicating that the barrels consisted of this grade.

"We recommend this to your earnest attention and we are bound to say if you inquire of the trade generally in Glasgow you will find that this is the opinion in general throughout British importers. Signed, Watson & Phillip."

These complaints are rather intensifying than decreasing, and in this last season when there was no tremendous crop and consequently no great rush on the part of the packers when they might perfectly well have dealt with their fruit honestly and properly, it seems to have been worse than ever before, and I felt it is important that these facts should be shown and ventilated here and published at large, and the people who are particularly concerned in the trade at large should be informed of it.

Mr. McMILLAN.—I don't know of a single farmer that has shipped apples for a number of years in our district, but the apples are all picked by the farmers themselves, put in heaps in the orchard, and the buyers buy them and send their men around to pack them.

Hon. Mr. FISHER.—That is the system adopted in the Annapolis Valley.

Mr. McMILLAN.—I am against leaving the apples in the field. We pull all the apples, put them into the barrels and take them into the shed, put straw around them and leave them and they lay there for a week or ten days before being packed. But those apples that are left out in the sun are injured. They are not only damaged because of the sun but there is a little worm that gets into them if they are left out in the air very long.



## RESULTS FROM TEST GROWING OF CROPS.

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COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
Tuesday, 30th May, 1899.

The Select Standing Committee on Agriculture and Colonization met this morning at 10.45 a.m., the Chairman, Mr. Bain, presiding.

Dr. SAUNDERS, Director of the Experimental Farms, being present at the request of the Committee, gave the following evidence:—

MR. CHAIRMAN AND GENTLEMAN,—It affords me much pleasure to appear again before the Committee and to have the opportunity of submitting some of the results obtained from the principal lines of work which have been carried on at the Experimental Farms during the year, hoping to have the benefit of your criticism, and of any suggestions you may think it desirable to make.

In all branches of the work conducted at the Experimental Farms honest effort has been made to gain reliable information and to give to the farmers of this country not a one-sided statement, but to present in a plain and simple manner the whole truth, regardless as to how that may conform to any preconceived theory.

During the eleven years that I have had the honour of holding the position of Director of the Dominion Experimental Farms, constant effort has been made to assist the farmers of this country in their endeavours to overcome the difficulties which arise in connection with their work, and to help them to make farming in Canada more profitable. Reliable information has been continually given, and to some extent the material has been supplied by the proper care of which larger crops may be expected. The principles on which, in my opinion, good farming rests have been many times discussed and plainly set forth during the past eleven years, including:

1. The importance of maintaining the fertility of the soil, without which a succession of good crops cannot be secured. In connection with this subject the proper care of barn-yard manure and the best methods to adopt in using this great and almost universal source to the farmer of plant food, has claimed much attention. The ploughing under of green crops has been treated of, and especially of clover, and its value demonstrated by many experiments, in enriching the land and adding humus to the soil, whereby its power of holding moisture is materially increased. The farmer has also been frequently advised to economize the elements of fertility in his land by a judicious rotation of crops.

2. The best methods of preparing the soil for crop, including the important subject of underdraining, thorough ploughing, and subsequent harrowing, to bring the soil into a thorough condition of tilth. The importance in the eastern provinces of the Dominion of autumn ploughing and on the western plains of summer fallowing in order in the latter case to conserve the necessary moisture, also the advantages in some parts of the rolling of land, after sowing, to produce suitable conditions of moisture for the prompt germination of the seed.

3. The importance of early sowing has been demonstrated by a series of experiments which have been carried on for nine years in six successive sowings of the more important cereals, whereby it has been shown that the best results are obtained by sowing the grain as soon as possible after the land is in fit condition to receive the seed.

With the oat crop it has been shown that a delay of a week in sowing beyond this period involves a loss of 10 to 12 per cent, two weeks 20 per cent, three weeks nearly 30 per cent, and by a delay of four weeks over 40 per cent of the crop is lost.

With the barley crop, a delay of one week beyond the time when the soil is fit to receive the seed involves a loss of more than 15 per cent, two weeks more than 25 per

cent, three weeks a loss of 33 per cent of the crop and four weeks a loss of over 45 per cent.

With the spring wheat crop a week of delay beyond the proper time results in a loss of at least 25 per cent, two weeks 35 per cent, three weeks over 45 per cent, and four weeks delay causes a loss of more than half the crop. These are the results from an average of nine years' experience.

4. The choosing of the best varieties of grain, fodder plants and roots to sow in the several climates of the Dominion, taking into consideration productiveness, quality and earliness of ripening.

5. The selection of well-ripened and plump seed for sowing. Along all these lines the Dominion Experimental Farms have done excellent service, the value of which is much appreciated by the farming community, and has been attested to by many unbiassed and competent witnesses, both in this country and abroad.

#### MAINTAINING THE FERTILITY OF THE SOIL.

The first of these great foundation principles, that of maintaining the fertility of the soil, has been referred to at some length in the evidence I have given before this Committee during the past three or four years. Permit me in a few words to review the chief points which have been established by the experience gained at the Experimental Farms.

That in the case of barn-yard manure it is of the greatest importance that the liquids should not be permitted to waste, but should be mixed with the solids in suitable water-tight troughs, placed behind the animals in the barn. That the application of manure to the land fresh from the barn-yard is the most economical method to adopt. That where manure is composted and rotted for three months it loses more than half its weight, and when this is allowed to lie another three months the loss in weight is over 60 per cent, and at the same time under the usual treatment given to this material in the barn-yard, it loses also a considerable portion of its valuable fertilizing constituents. In the series of experiments with fertilizers at the Central Experimental Farm, of which I gave you, last year, the results of 9 and 10 years experience, it has been shown that fresh manure ton for ton is equal in effect in its beneficial action on crops to manure which has been rotted in the ordinary way. The experience of another year has confirmed the conclusions drawn from the experiments previously reported on.

The average of the crop of spring wheat grown for eleven years on the same plot, and which has received manure in the proportion of 12 tons per acre the first year, and 15 tons per acre each year since, has given from the rotted manure an average for the whole period of 20 bushels 56 lbs., and from the same weight of fresh manure 20 bushels 52 lbs. The average weight of straw given during the same period has been 3,700 lbs. per acre where the rotted manure was used, and 3,699 lbs. where the fresh manure was used.

From plots of barley on which barn-yard manure has been used in the proportion of 15 tons per acre for ten years, the land treated with rotted manure has given an average crop of grain for the ten years of 34 bushels 34 lbs., while the land treated with fresh manure has given 35 bushels 21 lbs. The average weight of straw has been 3,054 lbs. from the rotted manure, and 3,280 lbs. from the fresh manure.

From the plots of oats treated with the same quantities of manure for ten years the average crop of grain for ten years has been 48 bushels 14 lbs., from the land treated with rotted manure and 54 bushels 17 lbs., from the land treated with fresh manure. The straw during the same time has averaged 3,235 lbs., from the rotted and 3,467 lbs. from the fresh manure. In the case of the wheat we have a difference of 4 lbs. per acre in favour of the rotted manure, in the barley there is a difference of 35 lbs. in favour of the fresh manure, while in the case of the oats the plots treated with fresh manure have given an average yield of grain for the ten years of 6 bushels 3 lbs. per acre more than has been had from the use of the same weight of rotted manure.

The crop of straw on the wheat plots has averaged practically the same, the difference in weight being only one pound per acre in favour of the rotted manure. On the barley plots the fresh manure has given an average of 226 pounds more straw and in the case of the oats the increase in the straw from the use of the fresh manure has been 232 lbs. as the average of the ten years test.

In the growing of Indian corn for ensilage for a period of eleven years, using manure at the rate of 12 tons per acre each year, the average of two plots has given a greater weight of fodder from the use of fresh manure by 286 lbs. per annum.

In the growing of mangels for ten years with barn-yard manure applied at the rate of 20 tons per acre the advantage has been with the rotted manure, which has given an average of 1,943 lbs. more of these roots than the plot treated with fresh manure. With turnips the larger crops have been had from the fresh manure, the difference amounting to 658 lbs. per acre. In the growing of carrots for 8 years on plots manured at the rate of 15 tons per acre the advantage has been with the fresh manure to the extent of an average of 1 ton 222 lbs. per acre.

In the growing of potatoes, which have now been tested for five years, during which time manure has been used in the proportion of 15 tons per acre, each year, from the average of the plots for that period we have had from the land on which the rotted manure was used an average crop of 266 bushels 17 lbs., per acre, while the plot treated with fresh manure has produced an average crop of 272 bushels 32 lbs., a difference in favour of the fresh manure of 5 bushels 15 lbs., per acre.

If the farmers of Canada would generally adopt those methods of handling and applying barn-yard manure which have given such good results at the Experimental Farm, the saving effected would be enormous. The number of cattle in the Dominion is estimated at about  $4\frac{1}{2}$  millions and the horses at  $1\frac{1}{2}$  millions, and the total quantity of manure produced annually by these 6 million animals, including liquids and solids, is probably not far short of 100,000,000 tons. If all this manure were handled in the best manner its value in bringing increased crops would probably be at least twice what it now is.

#### OTHER EXPERIMENTS WITH FERTILIZERS.

Having now continued the important experiments referred to as to the relative value of fresh manure as compared with rotted manure in the growing of spring wheat for eleven years and barley and oats for ten years, and finding the results obtained so very conclusive, it has not been thought necessary to continue this special line of work longer, and some important changes in the experimental work with fertilizers have been made in the tests being carried on with fertilizers. In the first place, with the view of gaining information as to the length of time which the ten or eleven annual applications of manure which have been made will continue to influence the crops, the manuring has been discontinued on these plots and the same crops are being grown without manure. Before any changes were made in the course of this work fair representative samples of the soil were taken by the chemist of the farms, Mr. F. T. Shutt, from each of the 95 plots used for the experiments with fertilizers, also from the 10 check plots on which the crops have been grown without fertilizers. When the complete results of these analyses are available, they will no doubt aid us in reaching satisfactory conclusions as to future lines of experiments in this connection. I may say that Mr. Shutt informed me this morning of the particulars he has obtained up to date. He has determined the amount of nitrogen on most of the plots on which barn-yard manure has been used and they show at the present time a slightly larger proportion in the soil where the rotted manure has been used than from that to which the fresh manure has been applied; and both of course show a very much larger amount of nitrogen in the soil than there is in the sample taken from the check plots where no manure has been employed.

There is little doubt that the crops obtained for some years past on the plots which have been treated with artificial fertilizers at the Central Farm have been smaller than might have been fairly expected. One reason for this lies probably in the fact that



these fertilizers contain no humus, and that this ingredient in the soil has been largely exhausted by constant cropping. The capacity of the soil for holding moisture has no doubt been thus considerably reduced to the detriment of its crop producing power. To gain information on this point there has been sown this year with the grain on all the plots after the fertilizers were applied common red clover in the proportion of 10 lbs. per acre. The growth obtained from this sowing will be ploughed under late in the autumn, and in this way much humus will be added to the land, and at the same time the effects of the addition of the fertilizing material accumulated by the clover plant will be noted. Clover has also been sown on the plots hitherto treated with barn-yard manure. It is expected that information of much interest and value will be gained by these modifications in the course of experiments referred to. There is no doubt that artificial fertilizers have their place in the economy of farm management, nevertheless barn-yard manure on which so large a proportion of our farmers depend will, with the ploughing under of green clover, be relied on as the chief means of enriching the soil in most parts of Canada.

In the evidence given you last year I referred at some length to the crops obtained from some of the plots treated with artificial fertilizers. I do not deem it necessary to go over this ground again further than to remark that the experience of another year has not materially modified any of the figures then submitted to you or affected the conclusions then reached. Since it was shown at that time that finely ground mineral phosphate untreated, applied in liberal quantity annually for nine or ten years had produced no beneficial effect whatever, the use of this material was discontinued last season, and the Thomas's Phosphate substituted in the same quantity on all the plots to which the untreated mineral phosphate had formerly been applied. No very marked results have been had from this change; there has, however, been a perceptible increase in the weight of Indian corn grown on some of the plots so treated and a slight addition to the weight of the crop on some of the plots of roots.

#### THE PLOUGHING UNDER OF CLOVER.

The experiments which have been conducted in the growing of clover to plough under to enrich the soil and add humus to the land have shown that clover can be sown with wheat, barley and oats without lessening the grain crop for the current year. They have also shown that when ten pounds of red clover seed is used per acre, sown with the grain, and a fair catch is the result, the clover after the grain is cut makes a vigorous growth, serves the purpose of a catch crop during the summer, gathers a large quantity of nitrogen from the air and stores this up in its leaves, stems and roots; that the roots range far and deep to gather food, going deeper than most other plants can go, and converting considerable quantities of unavailable plant food into available forms. The stores of nutritive material so gathered are, when the crop is ploughed under, of great advantage to the land and add materially to its fertility. The experience of another year has added fresh testimony along this line and confirmed these conclusions.

#### VALUE OF CLOVER AS AN ENRICHER OF THE SOIL.

The following experiments have afforded convincing testimony as to the value of clover when ploughed under as an enricher of the soil. In 1897, eight plots of  $\frac{1}{20}$ th of an acre each were sown with grain, two each with spring wheat, six-rowed barley, two-rowed barley and oats. On one plot in each case clover was sown with the grain in the proportion of 10 lbs. of seed to the acre, while on the other plot the grain was sown without clover. The plots sown with clover had produced a good mat of growth by October when they were all ploughed about 8 inches deep. In the spring this land was disc-harrowed and harrowed with the smoothing harrow, after which the whole area was sown with one variety of oats, the Banner. These were sown on the 27th of April, and they came up on the 6th of May. The difference in the growth of the grain on these plots was soon very noticeable, and as the season advanced, especially just

before the heads appeared, the difference in height and vigour of growth in favour of the plots where the clover had been grown was very remarkable. So clearly was this manifest that the difference could be distinctly seen at a considerable distance and the outline of those plots on which no clover had been grown could be readily traced by the shorter and less vigorous growth. After the grain was fully headed the difference in growth, although not so readily seen at a distance, could be easily distinguished by close inspection. When ready to harvest the boundaries of the several crops were carefully marked, when the grain was cut and threshed separately. The results showed an average increase in the yield of grain on the plots on which the clover had been grown of eleven bushels one pound per acre, and the average increase in weight of straw was 1,114 lbs. per acre. On another set of plots grain was grown in 1897, clover being sown with it in different quantities per acre, 3 plots being left out of 15 as check plots on which no clover seed was sown. As it was intended to plant corn on this land the following year the clover was allowed to remain in the ground until the 23rd of May following by which time it had made a strong and heavy growth. This was ploughed under about six or seven inches deep and harrowed with the smoothing harrow, when the whole area was planted with one variety of corn, the Longfellow. On the plots where the clover had been grown the difference in the vigour of the corn plants was quite manifest all through the season and when cut on the 15th of September for ensilage those plots which had been sown with 8 lbs. of clover and upwards gave an average yield of 17 tons 1,356 pounds, while the 3 check plots on which no clover had been sown gave an average of 13 tons 1,133 pounds per acre, a difference in favour of the plots sown with clover of an average of 4 tons 223 lbs. per acre.

Some further experiments have also been made during the past year in determining the weight of clover leaves, stems and roots per acre turned under when the crop is ploughed late in the autumn. These confirm the results obtained in previous years, and show that the use of 10 lbs. of clover seed per acre is attended with the best results. In the set of plots provided for corn where the clover was left in the ground all winter and allowed to grow until May following some surprising results relative to the weight of the leaves, stems and roots were obtained. Blocks of earth were cut out of these plots 4 feet by 4 in width and 9 inches deep and the leaves, stems and roots of the clover carefully collected and weighed. The weight was found to average about double that obtained by a similar method in the autumn, and points to the economy of pasturing the clover in the autumn whenever practicable, and turning it under in May following, in time for a crop of corn or potatoes.

An experiment was also made in inoculating clover seed with nitrogen, which is a culture of the bacillus found in the nodules growing on the roots of clover. The inoculated seed was sown on the 14th of June, and a plot alongside of it sown at the same time with seed untreated. On looking these plots over late in the autumn, they appeared on casual examination to be very much alike, but on more careful scrutiny the plants from the treated seed seemed the most vigorous. On collecting the leaves, stems and roots in the manner already described, it was found that the inoculated seed had produced eight tons 674 lbs., while the untreated seed gave 5 tons 205 lbs., a difference of 3 tons 469 lbs., in favour of the seed treated with nitrogen. In regard to the last point mentioned in connection with maintaining the fertility of the land, namely, by a judicious rotation of crops, this had been repeatedly urged as most important. As the proportion of the several fertilizing constituents taken from the soil by different crops during their growth varies considerably, the economy of a judicious rotation is evident. This course has been advocated from time to time when addressing farmers' meetings in different parts of the Dominion, also in replies to many letters of inquiry which have been received on this subject.

#### PREPARATION OF THE LAND FOR CROP.

In reference to the next important item in good farming, the proper preparation of the land for the crop, some of the recommendations must to some extent be varied to

meet the requirements of different climates. No success, however, need be expected anywhere in the growing of crops on wet land ; in such cases underdraining is essential. The removal thus of superfluous moisture raises the temperature of the soil, permits of the access of air, so essential to the formation of available plant food and to healthy growth, and admits of early seeding, all of which are matters of very great importance. The benefits of underdraining have been demonstrated at the Central Farm in the reclaiming of a considerable area of land which was formerly a swamp. Its benefits have also been clearly shown at Nappan, N.S., and to a more limited extent at Brandon, Man. The advantages of fall ploughing in the eastern provinces of the Dominion have been repeatedly shown. The exposure of the soil to the action of frost, sunlight and air is beneficial, and spring work is materially advanced and crops can be got in earlier by the general adoption of this plan.

The reduction of the surface to a thorough state of tilth is also important, so that a fine seed-bed be provided, giving conditions favourable for prompt germination and rapid growth of the young plant. The rolling of land after sowing is often useful, especially if the rain-fall is scanty, as this provides suitable conditions of moisture for rapid germination of the seed. It has been stated that rolling the land after seeding "warms the seed-bed," and that "examination made of eight farms in the spring on lands sown to grain showed that in clear weather the temperature was 3 degrees higher to a depth of 3 inches when the land was rolled than when the land was left unrolled." These particulars were taken from a book written by Prof. F. H. King, of Madison, Wis., on "The Soil." On page 232 he refers to the taking of the temperature of the soil on eight Wisconsin farms, between 1 and 4 p.m., at a depth of 3 inches below the surface, when he found the temperature in rolled land to be  $2\frac{9}{10}$  degrees higher than on land not rolled. But he also says : "The effect of rolling the land on the temperature of the soil is often very marked, its general tendency being to make it warmer during bright clear weather, but in cloudy and cold weather it has the opposite effect, rolled land tending to cool more rapidly."

#### IMPORTANCE OF EARLY SOWING,

With regard to the third element in successful farming, the importance of early sowing, I have already given you the results of a series of experiments which have been carried on for nine years, by which it has been shown that delay in seeding at Ottawa has caused an annual average loss of from 10 to over 50 per cent in crop, the proportion of loss increasing as the delay is greater. This, however, does not apply with equal force to all the climates of the Dominion. Similar experiments have been conducted for several years at all the branch farms, and the results obtained have in some instances varied considerably. At the Experimental Farm at Nappan, N.S., the results of delay in seeding have been much the same as at Ottawa, but the proportion of loss has been less. At the three western experimental farms, Brandon, Indian Head and Agassiz, although we occasionally find that late sown grain, especially oats, gives larger crops than when sown early, these instances are exceptional, and the average results show an advantage from early sowing, but the advantage is not so decided as in the eastern provinces.

#### THE BEST VARIETIES TO SOW.

We now come to the consideration of the 4th important principle in connection with profitable farming, that of the selecting of the best varieties of grain, fodder plants, and roots, for seed to sow in the several climates of the Dominion taking into consideration productiveness, quality and earliness of maturing. Long experience has taught me that attention to this point is a very essential element in successful farming. That there are varieties more productive and earlier in maturing than other sorts cannot be successfully disputed as the facts ascertained in connection with the experimental farms as well as the experience of farmers generally afford the strongest evidence of the truth of this statement.



The question of the selection of seed is a most important one, and cannot in my opinion be too strongly recommended. It has been the practice at the Experimental Farms ever since their work was begun to select the seed grain used for sowing from year to year by separating the light and imperfect grain with the fanning mill, and by the use of suitable sieves to separate the small kernels from the plump and well matured grain and use the latter only for seed.

The Red Fife wheat is said to have originated with David Fife of Otonabee, Ontario, about the year 1842. The three heads which were produced the first year were preserved and the grain was soon rapidly increased from year to year. It was its unusual productiveness and vigour from the start which attracted attention. For many years Red Fife was grown extensively in Ontario, and found to be very productive and useful. It was subsequently sent to the North-west country, where it carried its productive habits with it, and where under favourable conditions as to soil and season it continues to produce large crops from year to year. Similar remarks might be made of the Banner oat which was first brought into notice by the late Jas. Vick, seedsman of Rochester, N.Y., also of the Mensury barley which was introduced from China. From the start these varieties were productive to an unusual degree and it was this fact which led to their rapid introduction, and they have carried this impress of productiveness and vigour with them wherever they have been sent, and have averaged bountiful crops on every favourable season.

In the four years' experience in the growing of oats we find that the highest yielders have averaged, at all the Experimental Farms, as follows :—

	Bush.	Libs.
Banner.....	71	17
American Beauty.....	71	16
Columbus.....	70	5
Golden Beauty.....	67	17
Bavarian.....	66	33
Holstein Prolific.....	66	18
White Schonen.....	65	29
Early Golden Prolific.....	65	27
Wallis.....	65	16
Abundance.....	65	9
Golden Giant.....	64	19
White Russian.....	64	11
Improved Ligowo.....	64	6

An average for the first twelve varieties of 67 bushels 4 lbs. per acre, as the result of four years' test at all the Experimental Farms. In Bulletin No. 32, published in December, 1898, a summary is given on page 47, showing some of the results of the year's work in this connection. I take the liberty of reading this extract :—

"The particulars presented in this bulletin show the importance of choosing the most prolific and vigorous growing varieties for seed. They also afford further proof that the tendency to great productiveness in certain sorts is to a large extent fixed and permanent. As an example, 12 varieties of oats, which are listed in this bulletin as having given the largest average crops at all the Experimental Farms for the past four years, includes 10 of those given last year as the best for three years. Further, in comparing these two lists of the best 12 sorts of oats for each Experimental Farm, we find this year at Ottawa 10 out of the former 12, at Nappan 10 of the 12, at Brandon 11 of the 12, at Indian Head 10 of the 12, and at Agassiz 9 of the 12. A careful scrutiny of the lists of the other sorts of grain will afford further evidence along this line.

"The variations between the largest and smallest crops in the uniform test plots on the Central Experimental Farm, while not quite so marked in 1898 as they were in 1897, are still very large. In the oats the crops range from 89 bushels 14 lbs. to 42 bushels 21 lbs.; in the two-rowed barley from 55 bushels 20 lbs. to 31 bushels 10 lbs.; in the six-

rowed barley from 58 bushels 16 lbs. to 33 bushels 16 lbs. ; in the spring wheat from 31 bushels 15 lbs. to 15 bushels, and in the pease from 46 bushels 50 lbs. to 20 bushels.

"These facts should induce farmers every where to pay more attention to the selection of the most promising sorts for seed. Any of these varieties which are among the twelve which have given the best average crops for the past four years may be sown with the confident expectation of a good crop, provided the season is fairly favourable, and the general use of these more productive sorts for seed would soon raise the average yield of the Dominion several bushels which would add some millions of dollars yearly to the receipts of the farming community in Canada."

#### SELECTION OF PLUMP AND WELL RIPPENED SEED.

The last point bearing on successful farming, that of the careful selection of plump and well-ripened seed for sowing, is of much importance. Good farmers have for a long time followed the practice of selecting their best seed for sowing by separating with the fanning mill the light and imperfect kernels from their grain and sowing the best and plumpest, and this has been the practice at the Experimental Farms. To show the teaching of the Experimental Farms in this matter, I would refer to my annual report for 1891, where I said: "One of the most important means within the farmers' reach is the selection of good seed. Every seed has an individuality of its own impressed on it by nature which, under favouring conditions, will manifest itself. Each seed is provided with a germ wherein lies this impress of individuality, and this germ is embedded in a store of such food as is best suited to stimulate the growth of the young plant. When the seed is plump, that food supply is bountiful, and the infant plant so nourished makes rapid headway, but when the seed is imperfectly developed, the store of nourishment is much lessened. Crops are thus often enfeebled at the start and delayed in ripening by the use of poor seed, or they ripen unevenly and lack that vigour so necessary to a liberal return. It is well known that some farmers by the selection of good plump seed and thorough preparation of the soil grow oats from four to eight pounds heavier per bushel than many of their neighbours."

In the annual report for 1897, the following appears:—

"The advantages arising from the selection of plump, well-matured seeds of the best sorts have been frequently urged and the good results from such a course demonstrated."

#### SELECTION OF SEED FROM LARGER HEADS.

Among the earliest experiments conducted at the Experimental Farm was a series of tests specially bearing on this subject. In the spring of 1888, a considerable number of varieties of different sorts of grain were chosen, and good average sized kernels sown one foot apart each way, the object being to grow very strong plants which would produce large heads from the best of which seed might be selected for sowing the following year. The weight per hundred of the kernels sown in each case was noted and on selecting the largest kernels for the second year's sowing from the finest heads it was found that the grain had increased in weight as compared with the original average unselected seeds from 25 to nearly 50 per cent. The results of this work were submitted to the Royal Society of Canada in 1889 ; they also formed the subject of a paper presented at the meeting of the "Society for the Promotion of Agricultural Science" held in Toronto in 1889. In the spring of 1889 the largest and plumpest kernels chosen from the fine crop of 1888 were sown, but the season was unfavourable and rust prevailed on all the grain crops to an unusual degree. The result was that the crop from the very plump kernels was so small and the grain so shrivelled that the material was quite unfit for any further experiments in this direction.

Three years ago this line of work was started afresh. The largest kernels obtainable were selected and sown, but that season was not favourable and the results were unsatisfactory. Last year this branch of work was not taken up, but during the past

winter the largest kernels obtainable were selected from 188 varieties, 65 of wheat, 55 of barley and 68 of oats. These have all been sown. Thirty kernels in each case in two rows, each one foot apart, with two feet of space between each plot. These plants are now well up, and if the season proves favourable will, I trust, give us some interesting results.

Mr. McMILLAN.—It is important to select seed, but it is just as important sometimes to get new seeds. It might be as well for me to read what Prof. Lloyd, lecturer in King's College, London, says in his book "The Science of Agriculture," and the Committee can judge for themselves.

"Change of Seed. Assuming that the farmer has employed good germinating seed and clean seed, his crops for some time will be all that can be desired, and each year will supply him with seed for the next. In the course of three or four years, however, it will be found that the crop—and this applies specially to wheat and other cereal crops—is deteriorating. It will now be necessary to seek some new seed. This is termed the change of seed. In seeking for new seed not so much the variety will be considered as the conditions under which the new seed has been grown, and it will be desirable to select seed which has previously been grown under conditions less advantageous than those it will now be subject to. Thus, seed should be selected from a colder district——"

—you will remember I said that we always brought our seed from the north when we purchased seed——

—"from a poorer soil, and from a soil of a different character. If, therefore, it is required to bring seed from a superior to an inferior climate, such as from Australia to the south of England, it can only be done in two stages: first, by taking the seed to a colder and less favourable climate and soil even than the south of England—say to Scotland—and then subsequently transferring it to the south of England. It would here regain to a great extent the vigour and properties it had originally in Australia."

That is the opinion of one of the most scientific men in England in regard to the change of seed. My experience after 50 years in Canada—perhaps I have not observed as keenly as some people, but I have observed this closely—that much of our success as farmers we owe to change of seed. We find seed will improve for a while, but it will go back and it is always necessary to change. One variety will give a greater yield than another, showing that there is a good deal in variety.

Mr. CALVERT.—In changing seed, would you recommend the change from sandy to clay soil?

Mr. McMILLAN.—I would, most certainly, change to a sandy soil, if I could, from heavy soil, or from poor to rich. I find that holds good with stock and with seed; I would always take stock or seed from a poorer farm than they were to go on.

Mr. SEMPLE.—The facts that Dr. Saunders has brought to the notice of the committee, to-day, about drainage, and that as far as manure is concerned, the only manures to be depended upon are ploughing down the clover and barn-yard manure, are very interesting. It will not do for the farmer to purchase artificial fertilizers; that may do for market gardeners. Then, in regard to seed, the best of our farmers are very careful in selecting their seed. Now, in my county, I have handled a good deal of oats, and in that county they sow the Banner oat, and after all, whether it is a good or a poor year, it depends on climatic conditions. Farmers are sensible enough to provide the best varieties, but beyond that they cannot control the climate. The evidence brought forward to-day and the facts stated will commend themselves to the best farmers.

Mr. ERB.—What I have heard to-day I agree with, and my experience bears it out. We should circulate among the farmers the evidence given to-day.

*By Mr. McMillan:*

Q. You spoke, Dr. Saunders, of fertilizers having given a certain increase; would the increase be sufficient to pay for the cost of purchasing and handling the fertilizer?



A. I suppose you refer to my statement that we substituted Thomas's phosphate last year on some of the fertilized plots for mineral phosphate finely ground, which we had found after ten years of experience to be of no value as a fertilizer?

Q. It was the Thomas's phosphate?

A. I found last year there was some increase in the corn and root crops fertilized by the Thomas's phosphate, but I do not think the increase in this case was sufficient to cover the cost of the fertilizer.

*By Mr. Stenson :*

Q. I would like to have it explained in regard to green manure, that in most cases the effects are better than when it is employed rotted; will the professor give us particulars as to how it is spread and at what seasons on the farm. It would be precious information for the farmers. We use it in small heaps all winter, while some wait for the spring, some wait for root crops and plough it under, and others do it in the drills?

A. The explanation as to the way these special plots are treated, of which I have been speaking, is this: These are plots of  $\frac{1}{10}$ th of an acre each, and on the first plot rotted manure is used in the proportion of 15 tons to the acre, while on the same size plot and adjoining we used fresh manure, the same crops being continuously grown in each plot. Please bear in mind this is not a plan I would advise farmers to follow, but is adopted by us for the purpose of getting information.

*By Mr. McMillan :*

Q. At what season do you apply the manure?

A. The manure is applied just before sowing when it is spread evenly over the ground and turned under a few inches.

*By Mr. McGregor :*

Q. Do you use a disc harrow or a common harrow?

A. We use a common harrow in this case and harrow lightly, otherwise we would be likely to drag some of the manure to the surface. The object is to bury the manure in the soil not more than three or four inches deep so that it may be more readily available to the crop. In these experiments the manure is composed of equal weights of cow manure and horse manure, the green manure is used within two or three days of the time it is made. The liquids and solids both saved and mixed together, and put on the plots, the same weight being used in both cases.

*By Mr. Stenson :*

Q. All over the snow?

A. No; in both cases it is applied in the spring just before seeding, spread evenly and then ploughed in.

*By Mr. McMillan :*

Q. And in what condition is the rotted manure kept during the winter?

A. It is rotted for three months before using and consists of equal parts of cow and horse manure, made into a pile in the usual way and turned over as often as is necessary to bring about rapid decay. The point I wish to make clear is that in using this fifteen tons of manure to the acre, the results had in crops from the fresh manure have averaged quite as good as those from the same weight of rotted manure. In leaving green manure to rot, it loses fully 40 per cent of its weight if left for three months, and 50 to 60 per cent of its weight when it is left for five or

six months. In our experience we find the use of green manure more economical than rotted. The plan we adopt for the winter is to distribute the green manure as made in small piles over the ground; the object of putting it in small piles being to prevent heating. These small piles freeze up quickly and thaw out again in the spring, when the manure is in much the same condition as if it had been freshly put out. It is then ploughed under. Where this course is practicable it is the most economical way to use barn-yard manure.

*By Mr. Stenson :*

Q. It would not be practicable on a hill?

A. It would not be wise to place manure on a hillside in winter where the soluble fertilizers in it would be liable to be washed away in the spring. While there is some loss in allowing it to rot in a pile, there might be greater loss from leaching if the manure was placed on a hillside. In all such cases the farmer must use his own good judgment, and he will thus be able to utilize the information given him to the best advantage.

*By Mr. McMillan :*

Q. In turning that manure during those three months do you use anything to prevent the ammonia escaping?

A. Not in these experiments, for the reason that it is not the practice for farmers to follow that method, and our aim has been to get our results under similar conditions to those which surround the average farmer. We used gypsum for this purpose in other cases and have found it to be a very good thing.

*By Mr. Erb :*

Q. In the comparison of the yield of crops sown late and early you refer to the remarkable difference in the yield of wheat sown late and early, but you made no reference in regard to pease, does the same difference hold good in regard to that crop?

A. Not so decidedly with regard to pease. We have tried similar experiments with pease along the same line but they have not been continued for so long a time. Pease have been tested for four years and the results we have had show that this crop can be sown late with less loss than either wheat, barley or oats, indeed the difference in crop between the second, third and fourth week in sowing pease is not very great. Pease sown the second week gave 33 bushels 30 lbs., those sown the third week 32 bushels, 26 lbs., the fourth week 30 bushels 23 lbs., the fifth week 26 bushels 42 lbs., and the sixth week 24 bushels 41 lbs., as the average of the four years test. The first has not given as good results as the second week, the crop averaging 29 bushels 26 lbs., the reason is probably this that the date on which the first sowing is made, which is just as early as the land can be worked, is rather earlier than pease should be sown. It also often happens that we have about that time strong wind storms which gather up sand from the high spots with light soil, and this sand is blown against the young blades and cuts the young plants to such an extent as to injure them. The estimates I have submitted of losses from delay seeding have been based on the end of the first week after the land is ready as the best time to get the seed in the ground. I have shown that by delaying a week after that time there is a considerable loss which is further increased in proportion to the length of delay.

Having read the preceding transcript of my evidence I find it correct.

WM. SAUNDERS.

COMMITTEE ROOM, No. 46,  
HOUSE OF COMMONS,  
Thursday, 1st June, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 a.m., Mr. Bain, the Chairman, presiding.

Dr. SAUNDERS, having been cited by the committee gave the following evidence:—

Mr. CHAIRMAN AND GENTLEMEN.—In my remarks to you at the last meeting, I submitted evidence in regard to some important principles which underlie successful farming in Canada. As an illustration of the result of the adoption and the carrying out of these principles, I wish to bring to your notice the results we have had at the Experimental Farm in Ottawa. We have made considerable progress in the way of increased crops. As you are aware, the Experimental Farm work was inaugurated in 1887. It required about two years to do the fencing, the clearing and the draining at the Central Experimental Farm, so as to get the land into fair order. Taking the three years following that period which would be the years 1889, 1890 and 1891 and comparing the average of these three years with the average of the past three years, 1896, 1897 and 1898, I think we get a fair idea as to the results which have been obtained by the carrying out of these principles by the practical methods which I brought under the notice of the committee at the last meeting.

In the first three years on the Central Experimental Farm the average crop of oats taking all the varieties under cultivation was 32 bushels 17 lbs. to the acre. During the last three years the average crop for the whole period has been 56 bushels, 6 lbs. per acre, an increase of 26 bushels and 13 lbs., a gain of more than 50 per cent.

In barley the average crops of the early three years was 31 bushels and 6 lbs., and of the later three years 43 bushels 13 lbs., being an average gain of 12 bushels and 7 lbs. per acre.

In wheat the average for the early three years of all the varieties was 15 bushels and 19 lbs., in the later three years 20 bushels and 9 lbs., showing a gain in the last period of 4 bushels and 50 lbs., nearly five bushels per acre over that of the early period.

Thus in the wheat the gain has been nearly 33 per cent, and that of the barley nearly 40 per cent.

The results have been brought about by the draining of the land and bringing it into a good condition of tilth, by the moderate use of barn-yard manure, the ploughing under of green crops of clover, the thorough working of the land, early sowing, the selection of the most productive varieties of seed and by carefully cleaning the grain and sowing only plump and vigorous seed.

It is sometimes urged that the growing of grain on small plots is no guide as to the crops you get from larger areas, and that is an objection of much force in some cases. As an indication as to how the crops from the plots compare with those of the fields, I submit to you the results obtained at the Central Farm during the past year. From the experimental plots of oats we have an average over the whole series of 66 bushels and 11 lbs. per acre. In the field plots amounting in all to  $54\frac{1}{2}$  acres of oats there was an average of 60 bushels and 14 lbs., a difference of nearly 6 bushels in favour of plots. But when you consider that the plots are sown on better average soil than the fields, on land selected on account of the more uniform character of its soil, I think the field crops show up very well.



*By Mr. Featherston :*

Q. In the plots is there not a greater distance between the varieties than in the fields?

A. There is a pathway of three feet left between the plots, this, as I have pointed out on several occasions, affords the plots an advantage by giving them more margin than can be had in a field, and grain will usually be found more vigorous along the margin than elsewhere. To lessen the force of this objection we arrange our plots so as to have them as nearly square as possible.

Q. On a field where there is space you often see three or four rows better at the outside than the grain farther in?

A. Yes, that point is very well taken.

In the experimental plots of barley the two-rowed varieties have given an average yield of 39 bushels and 46 lbs. per acre, while the field crops of four and a half acres in all have given 32 bushels and 6 lbs. In the six rowed barley while the average on the experimental plots was 44 bush. 28 lbs. the average of the field crops (10 acres in all) was 42 bushels and 2 lbs. In the spring wheat while the average of uniform test plots was 23 bushels and 39 lbs. the average of the field crops (9 acres in all) was 27 bushels and 13 lbs. In this later case field crops have given an average of nearly four bushels per acre more than the plots. In pease the average crop on the uniform test plots was 34 bushels and 30 lbs., while the field crops averaged 31 bushels and 35 pounds.

In Indian corn where the objection that has just been cited would not apply the crops from plots and fields come out very even. The average of the experimental plots cut green for ensilage was 18 tons and 1,216 lbs., and of the field crops (9 acres in all) 18 tons and 348 lbs.

The average yield during the past year from the best six varieties of turnips grown on the uniform test plots at the Central Experimental Farm was 29 tons 162 lbs. per acre, whereas the best six sorts at all the Experimental Farms averaged 33 tons and 1,102 lbs. per acre. This shows that the root crops throughout the Dominion have been unusually good during the past year. The best six varieties of mangels at the Central Experimental Farm gave an average crop of 32 tons 20 lbs. per acre, whereas the best six at all the farms averaged 33 tons and 898 lbs. per acre. Of carrots the best six varieties at the Central Farm gave an average of 23 tons 1,472 pounds per acre, while the best six at all the farms gave 25 tons and 232 lbs. per acre. Of potatoes the best 12 sorts at the Central Farm gave an average crop of 341 bushels 11 lbs. per acre, while the best 12 sorts at all the farms have given an average crop of 453 bushels 3 lbs per acre.

My chief object in bringing these figures before you is to show that by the application of the principles which I explained so fully at the last meeting of the Committee to all these Experimental Farms, the average crops have been increased and are much larger than those had by farmers in general. The large crops referred to are not obtained by the use of special methods of fertilizing the land nor are they the result of special skill in the operations. Everything done has been explained and nothing has been undertaken in the growing of crops at the Experimental Farms which could not be fairly well imitated by the average farmer farming in Canada.

I will now call your attention to a few of the experiments which have been carried on with other crops. Horse beans were again tried at the Central Farm on eight different plots and have given an average yield, when cut green for ensilage, of 3 tons 817 lbs. per acre. This is an unusually light yield for horse beans, but we have found them very subject to blight, and they suffered much from this disease last year. Two field plots of horse beans were also sown and gave an average of 3 tons 522 lbs. per acre. As the crop was not sufficient to permit further tests to be carried on in the feeding of cattle with ensilage made from the mixture of corn, beans and sunflowers, known as the Roberston mixture, no further feeding tests have been made with this mixture during the past year.

Sunflowers were tested on two half-acre plots, which gave an average weight in heads of 5 tons 984 lbs. per acre. Experiments have also been conducted with early

ripening Soja beans on six different plots, and the average weight of the crop, cut green for ensilage, was 11 tons 285 lbs. per acre. It will thus be seen that during the past season, and it was the same last year, the early Soja beans have produced on an average much more than the horse beans. This year they have produce more than three times the weight which has been had from horse beans. They seem to be equally rich in nitrogenous matter, and both horses and cattle are very fond of the Soja beans and eat them readily in the form of ensilage or when fed alone. I think these early Soja beans promise to be very useful, especially when cut green and mixed with Indian corn in the silo, and that probably the use of these beans throughout the Dominion will increase rapidly, provided the seed can be got at a reasonable price. Last year the Soja bean seed was sold at \$4 a bushel, which although the seed is small, is a high price for the farmer to pay, but if a large demand arises for them they will no doubt be obtained cheaper. They are now imported from Japan, but may also be ripened in the Southern and Central States.

*By Mr. Featherston :*

Q. How much seed did you use per acre ?

A. We have been testing this point, about which there was a good deal of uncertainty. We sowed in the first place in drills 35 inches apart, that was the widest space allowed for the beans, and the weight of green fodder in that case was 9 tons 520 lbs. to the acre. When sowed in drills 28 inches apart, the weight was 9 tons 890 lbs. per acre, very little more, you see, than in the other case. In drills 21 inches apart the yield was 10 tons 1,760 lbs. per acre. There were two sowings in 21 inch drills, the first on 26th April, and the second on 19th May. The figures I have given you were for the first sowing, and those sown on the last date in the 21 inch drills gave a weight of 11 tons 1,480 lbs. an acre. In drills 14 inches apart the yield had increased to 12 tons 1,800 lbs. per acre, so our experiments this year at all the Experimental Farms have been planned to adopt the latter sowings which were shown last year to give the best results, and to sow in drills 14 inches and 21 inches apart, the two distances which have given the best results.

Q. What was the amount of seed you used ?

A. Sown in 14 inch or 21 inch drills it would take just about the same as Indian corn—the beans are a little smaller than Indian corn—which would be from half a bushel to three pecks per acre.

*By Mr. Calvert :*

Q. About what height did these beans grow ?

A. They grew to an average height of about 42 to 46 inches.

Q. What time did you cut them ?

A. We cut them when the pods were well formed and the seed still green. The date of cutting was the 12th of September in this case.

*By Mr. Rogers :*

Q. How do you harvest these beans ?

A. They can be harvested in the same way as corn. If you have a corn binder you can use it for this crop, or you may use a common binder. Our plots being comparatively small we cut them by hand. Where the beans are sown wide apart the stems become much more woody than where they are sown at a distance 21 inches or 14 inches, and I think either one of these widths would be a proper distance to sow. In 1897 we sowed Soja beans in drills 9 inches apart and got a heavier crop than this year, but the beans did not mature as well. Like corn, this crop requires a certain amount of area to give it light and air, but at the same time you do not want it to become woody by sowing the rows too widely apart.

*By Mr. Douglas :*

Q. Is its usefulness confined to ensilage alone ?

A. We have not tried it for ensilage. We have fed the beans cut green to cattle, and the cattle will eat them readily. The quantity we have sown has not been sufficient to put into the silo to make a layer thick enough for a feeding test.

*By Mr. McMillan :*

Q. Would it not help to prevent the formation of woody fibre to cut it earlier?

A. Yes, no doubt, but then for ensilage we would not have the corn ready.

*By Mr. Calvert :*

Q. Do you cut it with the binder or the mower?

A. You can cut it with the binder without trouble.

*By Mr. McMillan :*

Q. Have you sent any seed to the other provinces? We tried the common horse bean several times, brought them out from the old country, and they didn't do any good with us?

A. We sent these Soja beans to be tried at the branch Experimental Farms also.

*By Mr. McGregor :*

Q. We tried horse beans some years ago from the Experimental Farm, and they were no good?

A. Horse beans will, as a rule, do well in the moist climate in parts of the maritime provinces; they will do fairly well in Quebec and sometimes at Ottawa, but more often the crop is poor here; and as you get further west they are of little value; not profitable enough to induce people to sow them.

*By Mr. Stenson :*

Q. Have you tried to sow the Soja beans with corn?

A. No, we have not. The tests we have made formerly in sowing horse beans and climbing beans with corn have fully satisfied me that this is not a good plan. The crop was exceedingly small and varied, so much that you could not get a definite quantity of beans from any given area. One plot may give a fair crop, while others give very little. So we always like to sow these beans by themselves and take a definite weight of each so that we have the materials we are using mixed in proper proportion. I may say that the evidence I have submitted as to the growth of crops on the Experimental Farm could be supplemented by similar evidence regarding the crops at the branch farms; they have also been increased by the adoption of the principles I have explained to you.

#### DISTRIBUTION OF TRIAL SAMPLES.

I desire now to call your attention to the distribution of samples that has been carried on during the present year, a distribution which was closed only a few days ago. Much useful work has been done by the distribution of these samples during the last nine or ten years. We have sent out only the best and most productive varieties and they have given, as a rule, very satisfactory returns in all parts of the Dominion. The results of the work this year, just completed on the 24th of May, show that we have sent out to 33,725 of the farmers of this Dominion samples amounting in all to about 64 tons. Every pound of this material has been carefully cleaned, selected, and all small grain rejected by the use of the fanning mill and sieves, and only the plump and well matured seeds have been disseminated. I have brought for the inspection of the committee samples of some of the varieties of grain which have been sent out which will corroborate what I have said about the careful cleaning of the grain at the Experimental Farm. While the usual distribution in three-pound samples has been carried on as heretofore, and 29,405 three-pound samples have been



distributed, a new departure has been made this season under which each farmer has received a sufficient quantity of seed to sow a one-tenth acre plot. In the distribution of the the three-pound samples no effort has been made to prescribe any particular size of plot on which these samples should be sown, the samples being small, it was scarcely practicable to do so. Some farmers have sown on a plot of one size and others on a plot double the size, hence a fair comparison of the results of the experiment one with the other owing to the difference in the area covered could not be accurately made. It was thought that by making a select list of farmers taking few from every county in every province of the Dominion, and choosing twelve or fourteen varieties of the best grain we had grown, and such as our reports from year to year had shown to produce the best results, and selecting the men to make this test from among these farmers who had made reports to us from year to year on samples they had received, we would in that way get into the hands of a large number of good men, in all the different climates in the Dominion, the same quantity of grain to be grown on the same sized plot. In this way we expect to get a more accurate and complete description of the results obtained from these samples and reach more correct conclusions regarding the actual service which these particularly productive sorts are able to render to the farmers of this country.

*By the Chairman :*

Q. About what is the average of the returns you receive from those to whom you sent out samples?

A. The average returns this year are much better than heretofore. In previous years we averaged about 23 per cent of returns where we sent out samples in response to applications from individual farmers, but where we have filled applications on lists which have been received from agricultural societies and members, we have not usually received more than three or four per cent of returns, and for that reason the Minister decided some two years ago that we should send only to those who applied individually, and it is gratifying to know that this limitation has not materially lessened the number of applicants. Farmers have applied for samples for themselves, and when doing so they have felt under a greater obligation to make the returns desired. The returns are not fully made up, but I think we must have received from 30 to 35 per cent this season.

Q. We are improving?

A. Decidedly, in that particular. In order to make the special distribution of grain for one-tenth acre plots as effective as possible, it was thought best to give farmers their choice of varieties. One might have land more suitable for oats and others for wheat or barley, so this circular was prepared and sent out in the early winter. It was addressed to a select list of farmers, which was prepared by going over all the returns that had been received and choosing those who appeared to take the deepest interest in the work. The following circular was prepared early in the winter, and a copy addressed to each of the farmers whose names had been placed on this special list :—

“DOMINION OF CANADA.

“DEPARTMENT OF AGRICULTURE,

“CENTRAL EXPERIMENTAL FARM,

“OTTAWA, .....189..

“DEAR SIR,—The reports received from you concerning the test of samples sent you from the Experimental Farm show that you are interested in the important work of seed testing. By instruction of the Honourable Minister of Agriculture, a new feature has been added to the grain distribution this season, namely, that of offering a few of the very best sorts in sufficient quantity to sow a plot of one-tenth of an acre. These samples will be sent to a select list of farmers chosen from each county and you are invited to co-operate in this work. As it is proposed to publish the results obtained in each county this test will, in a sense, be a competitive one. The samples will be sent free through the mails, one sample to each farmer.

"The size of the plots on which these samples should be sown is 33 x 132 feet or 66 x 66 feet, and the quantity of grain to be sent of the different sorts will be as follows :—Oats 8 lbs., spring wheat 10 lbs., and barley 10 lbs.

"The following varieties have been chosen for this special distribution: Oats—Abundance, Banner, Improved Ligowo, American Beauty, Bavarian and Golden Giant.

"Of spring wheat the Preston, Percy, Stanley and Advance.

"Two-rowed barley, the Beaver and Sidney, and of the six-rowed barleys the Royal and Trooper.

"If you desire that one of these samples be sent you for trial, please let me know which of the sorts named you would prefer, and name also your second choice in case the stock of your first choice should be exhausted. An early reply is requested. An addressed envelope is inclosed. All letters forwarded to the Central Experimental Farm, Ottawa, may be sent free of postage.

"Yours very truly,

"WILLIAM SAUNDERS,

*"Director Experimental Farm."*

There was a very prompt reply to this circular and in a few days we had returns from more than three-fourths of all those who had been addressed, and there was subsequently sent to this chosen list of farmers distributed all over the Dominion 4,320 samples. As these applications came in they were classified by counties—and where we found that any county was short in the number of samples applied for, efforts were made to supplement that number so as to bring it up to its proper proportions. In this way the grain has been fairly distributed over every section of the country. In some counties, especially in New Brunswick, where there has been a very great interest taken in this branch of experimental work, we had so many returns to choose from, that it was very difficult to reduce the number so as to make them even with other counties and to some a larger share was sent for the reason that the farmers in those counties have taken more interest in this work and given more satisfactory returns.

When sending out the varieties of grain chosen, some information was given on a printed slip attached to the circular giving some particulars as to how the special variety sent had succeeded on the Experimental Farms. It was thought that these particulars would tend to interest the farmer more fully in the variety of grain he had chosen.

Information was thus given with the several varieties sent out as follows :—

#### THE BANNER OAT.

The Banner oat was first grown at the Experimental Farms in 1890, and has been sown each year since with very satisfactory results. From the outset it has shown great vigour and has been very productive. It is a white oat with a branching head and a stiff straw. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 70 bushels 21 pounds per acre. The Banner oat has been similarly tested at all the Experimental Farms throughout the Dominion and has given, as the result of four years' trial, an average crop of 71 bushels 17 pounds per acre, which is the largest yield given by any variety. The heaviest crop yet obtained from this oat at any of the Experimental Farms was at Brandon, Man., in 1898, when it gave 106 bushels 6 pounds per acre. In 1895, at Indian Head, N.W.T., an 18-acre field of this oat gave an average of 106 bushels per acre.

#### GOLDEN GIANT.

The Golden Giant oat was first grown on the Experimental Farms in 1893, and has been tested each year since with very satisfactory results. It is a yellow oat with a sided head and a fairly stiff straw, which has proved vigorous and very productive. In the uniform test plots at the Central Experimental Farm this oat has given an average

yield during the past four years of 65 bushels 7 pounds per acre. The Golden Giant oat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 64 bushels 19 pounds per acre. The largest crop yet obtained from this oat at any of the Experimental Farms was at Indian Head, N.W.T., in 1895, when it produced 104 bushels 4 pounds per acre.

#### BAVARIAN.

The Bavarian oat was first grown on the Experimental Farms in 1894, and has been tested each year since with very satisfactory results. It is a white oat with a branching head and a stiff straw, which has shown much vigour and been very productive. In the uniform test plots on the Central Experimental Farm this oat has given an average yield during the past four years of 62 bushels 13 pounds per acre. The Bavarian oat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 66 bushels 33 pounds per acre. The largest crop yet obtained from this variety at any of the Experimental Farms was at Brandon, Man., in 1898, when it gave 109 bushels 14 pounds per acre.

#### AMERICAN BEAUTY.

The American Beauty oat was first grown on the Experimental Farms in 1891, and has been tested each year since and given satisfactory returns. This is a pale yellow oat with a branching head and fairly stiff straw, a vigorous grower and very productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 62 bushels 32 pounds per acre. The American Beauty oat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as a result of four years' trial, an average crop of 71 bushels 16 pounds per acre, which is only one pound per acre less than the Banner, which stands at the head of the list for productiveness. During the season of 1898 a five-acre field of American Beauty gave at the Central Farm an average crop of 82 bushels 11 pounds per acre. The largest crop yet given by this variety was had at Brandon, Man., in 1898, when it produced 113 bushels 18 pounds per acre.

#### IMPROVED LIGOWO.

The improved Ligowo oat was imported from France by the Experimental Farm in 1891, and has been grown each year since with very satisfactory results. It is a white oat, large and plump, with a branching head and stiff straw, a vigorous grower and very productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 65 bushels 30 pounds per acre. The improved Ligowo oat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 64 bushels 6 pounds per acre. The largest crop yet given by this variety was at Indian Head, N.W.T., in 1896, when it produced 92 bushels 32 pounds per acre.

#### ABUNDANCE.

The Abundance oat was imported from France by the Experimental Farms in 1891, and has been grown each year since with satisfactory results. It is a white oat with branching head and a fairly stiff straw, a vigorous grower and very productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 66 bushels 37 pounds per acre. The Abundance oat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 65 bushels 9 pounds per acre.



The largest crop yet given by this variety at any of the Experimental Farms was had at Indian Head, N.W.T., in 1895, when it produced 108 bushels 28 pounds per acre.

#### THE PRESTON WHEAT.

The Preston wheat is a cross-breed sort produced at the Central Experimental Farm, Ottawa, in 1888, by fertilizing the Ladoga wheat with the Red Fife. It is a bearded variety which has shown great vigour and productiveness. It has a stiff straw and ripens on an average about four days earlier than Red Fife. At the Central Experimental Farm it has been tested alongside of a large number of other sorts, under similar conditions, for four years, and has given an average yield for this period of 26 bushels 4 pounds, which is 2 bushels 4 pounds per acre more than that obtained from any other sort at Ottawa. The Preston wheat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial at all these farms, an average of 32 bushels 17 pounds per acre, being 1 bushel 17 pounds more than that obtained from any other variety tested. The largest crop yet given by the Preston at any of the Experimental Farms was at Brandon, Man., in 1895, when it gave 48 bushels 20 pounds per acre.

#### ADVANCE.

The Advance wheat is a cross-bred sort, which was produced at the Central Experimental Farm in 1888, by fertilizing the Ladoga wheat with the White Fife. It is a bearded variety with a stiff straw, which has shown much vigour and productiveness, and ripens on an average about three days earlier than the Red Fife. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 21 bushels 20 pounds per acre. The advance wheat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 29 bushels 8 pounds per acre. The largest crop yet obtained from this wheat at any of the Experimental Farms was at Brandon, Man., in 1895, when it gave 46 bushels 20 pounds per acre.

#### PERCY.

The Percy wheat is a cross-bred sort, produced at the Central Experimental Farm, Ottawa, in 1888, by fertilizing the Ladoga wheat with the White Fife. It is a beardless variety with a stiff straw, which has shown much vigour and productiveness, and ripens on an average about four days earlier than the Red Fife. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 21 bushels 7 pounds per acre. The Percy wheat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average of 30 bushels 24 pounds per acre. The largest crop yet obtained from this variety at any of the Experimental Farms was at Indian Head, N.W.T., in 1898, when it gave 45 bushels 20 pounds per acre.

#### STANLEY.

The Stanley wheat is a cross-bred sort, a sport which occurred in the variety known as Preston, a cross between Ladoga and Red Fife. This is a beardless sort with a stiff straw, which has shown much vigour and productiveness, and ripens about four days earlier than Red Fife. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 22 bushels 41 pounds per acre. The Stanley wheat has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial at all these farms, an average of 29 bushels 3 pounds per acre. The largest crop yet obtained from this variety at any of the Experimental Farms was at Nappan, N.S., in 1896, when it gave 49

bushels per acre ; the second largest crop was at Brandon, Man., in 1895, when it gave 43 bushels 30 pounds per acre.

#### THE TROOPER BARLEY.

The Trooper six-rowed barley is a hybrid which was produced at the Central Experimental Farm in 1889, by crossing the Swedish two-rowed barley with the Baxter, a six-rowed sort. It has been tested each year since with satisfactory results. This barley has a stiff straw, is vigorous in growth and productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 48 bushels 17 pounds per acre. The Trooper barley has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 46 bushels 29 pounds per acre. The largest crop yet given by this variety at any of the Experimental Farms was at Indian Head, N.W.T., in 1896, when it produced 67 bushels 14 pounds per acre.

#### ROYAL.

The Royal six-rowed barley is a hybrid which was produced at the Central Experimental Farm in 1889, by crossing the Swedish two-rowed barley with the Baxter, a six-rowed sort. It has been tested each year since with satisfactory results. This barley has a stiff straw, is vigorous in growth and productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 53 bushels 26 pounds per acre. The Royal barley has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial an average crop of 45 bushels 4 pounds per acre. The largest crop yet given by this variety at any of the Experimental Farms was at Brandon, Man., in 1895, when it produced 65 bushels 30 pounds per acre.

#### SIDNEY.

The variety of two-rowed barley known as Sidney is a hybrid produced by crossing the Swedish two-rowed barley with the Baxter, a six-rowed sort. This cross was effected at the Central Experimental Farm in 1889, and this barley has been tested each year since with satisfactory results. It has a stiff straw, is a vigorous grower and productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 39 bushels 38 pounds per acre. The Sidney barley has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 39 bushels per acre. The largest crop yet obtained from this variety at any of the Experimental Farms was at Indian Head, N.W.T., in 1896, when it produced 61 bushels 42 pounds per acre.

#### BEAVER.

The variety of two-rowed barley known as Beaver, is a hybrid produced by crossing the Swedish two-rowed barley with the Baxter, a six-rowed sort. This cross was effected at the Central Experimental Farm in 1889, and it has been tested each year since with satisfactory results. It has a stiff straw, is a vigorous grower and productive. In the uniform test plots at the Central Experimental Farm it has given an average yield during the past four years of 42 bushels 9 pounds per acre, which is the highest yield obtained from any of the varieties tried at Ottawa. The Beaver barley has been similarly tested at all the Experimental Farms throughout the Dominion, and has given, as the result of four years' trial, an average crop of 41 bushels 12 pounds per acre. The largest crop yet given by this variety was at Indian Head, N.W.T., in 1896, when it produced 66 bushels 32 pounds per acre.

These few particulars placed before the farmer some of the best results obtained at the experimental farms with the variety he had chosen.

*By Mr. McMillan :*

Q. This Preston wheat did fairly well in Ontario ?

A. Yes, it has done very well in Ontario. The average of the three-pound samples gave a result of somewhere about fifty, about fifty-two, pounds, I think. The result of between two and three hundred tests in Ontario and Quebec were very satisfactory.

*By Mr. Calvert :*

Q. This Preston is a spring wheat, is it not ?

A. Yes.

Q. Do you know if any of it was tried down in the western part of Ontario where I live, near London ?

A. I am not sure. There is very little spring wheat grown there. Some samples were sent out this year, I know, in that district. The Preston has been much sought after this year by those asking for samples of wheat.

*By Mr. McMillan :*

Q. Have you any evidence upon tests on the flour of the Preston wheat ?

A. Not yet. We have not had a large enough quantity of Preston to test its value for flour. The millers here require a car load for this purpose and it has not been possible to obtain that quantity. About a month ago a sample of Preston was sent to the High Commissioner for Canada, in England, and he was asked to submit it to the best experts in England and to have the report of any test they might make sent to me, but I have not yet received any report on this wheat. I hope, however, before very long to get some information on that subject. The kernel is a little longer but it seems to be as hard and as transparent as that of the Red Fife.

As soon as it became known that a special distribution of grain for one-tenth acre plots was being made, a large number of applications were received from all parts of the Dominion, but we were not able to entertain many of these except in a few counties where the representation was less than in other counties. In all cases where the larger quantity could not be sent, a three-pound sample was forwarded with an explanation of the reason why the larger samples could not be given. As soon as practicable after the results are received from these tests it is proposed to issue a special bulletin giving the average crop in each county, with the names of the most successful growers. A very considerable interest has been manifested in this new department in our distribution work, and it is believed that this effort to gain the fullest information on this subject and to assist in this way, some of the best farmers in each county in their efforts to improve the character of the seed grain they are using, will awaken a still greater interest in this work and materially assist in demonstrating the advantage of using the most prolific sorts for seed and also of thoroughly cleaning all seed grain used for sowing. The usual distribution of three-pound samples has been sent out by provinces in response to personal application as follows : Ontario, 7,192, Quebec 7,782, Nova Scotia 4,062, New Brunswick 4,684, Prince Edward Island 2,110, Manitoba, 2,086, North-west Territories 1,187, British Columbia 302, making a total of 29,405. The special distribution for one-tenth acre plots has been made to the different provinces as follows : (Most of these were sent out between the 1st and 20th of March so there should be no complaint as to any of these samples being received late.) Ontario received 1,305, Quebec 1,399, Nova Scotia 423, New Brunswick 520, Prince Edward Island 181, Manitoba 228, North-west Territories 149, British Columbia 85, making in all 4,320, all of which were sent by mail. The three-pound samples this year have included a considerable number of the new cross-bred sorts produced at the experimental farm sent out with the object of more thoroughly testing them, some of these continue to give much promise.



Many reports have been received from farmers who have had several years' experience with some of the varieties of grain distributed. Some have reported having from fifty to seventy-five bushels of oats as a result of the sowing of the three-pound sample at the end of the second year, and from 200 to 350 bushels at the end of the third season.

This third multiplication is fast bringing into more general use the best and most productive sorts in many parts of the Dominion.

#### SEED TESTING.

The testing for farmers of the germinating power of samples of seed grain has also been continued with much advantage in many cases. The total number of tests made this year has been 2,400. Many instances of samples being very deficient in vitality have been met with, and by the timely information sent, many farmers have been saved from the disappointment which would unavoidably result from the sowing of bad seed. I may say that in some instances the vitality of oats, especially from some parts of Manitoba and the North-west where the grain was much injured by rain during harvest and had sprouted considerably, the germinating power was reduced to 10 and 15 per cent, while in those places in the North-west where the harvest weather was good the percentage of vitality ran up to 90 and 97 per cent. The information given to farmers in these special cases was of great value to them and was much appreciated.

#### AVERAGE CROPS FROM MOST PRODUCTIVE VARIETIES FOR FOUR YEARS.

In the evidence given before this Committee last year I gave you particulars of the average crops of the previous three years, given by the twelve best varieties grown at the different experimental farms. I now submit to you the results obtained from four years' trial with oats, barley and spring wheat, which will show the varieties which have done best in each part of the Dominion during this period. These particulars emphasize the importance of growing the most prolific varieties, and at the same time afford further proof of the great inherent powers of productiveness in varieties and also that the stamp of productiveness is so fixed in variety and so permanent as to permit of these varieties being taken from one part of the Dominion to another, carrying this characteristic of productiveness with them.

#### FOUR YEARS' EXPERIENCE WITH VARIETIES OF OATS.

The twelve varieties of oats which have averaged the heaviest crops at the several experimental farms during the past four years, are the following:—

##### CENTRAL EXPERIMENTAL FARM, OTTAWA, ONTARIO.

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. Banner.....	70	21	7. Golden Giant.....	65	7
2. Golden Beauty.....	69	7	8. White Schonen.....	64	15
3. American Triumph.....	67	19	9. White Russian.....	64	2
4. Columbus.....	67	15	10. Joannette.....	64	1
5. Abundance.....	66	37	11. Early Golden Prolific.....	63	23
6. Improved Ligowo.....	65	30	12. American Beauty.....	62	32

An average crop of 66 bushels per acre.

##### NAPPAN EXPERIMENTAL FARM, NOVA SCOTIA.

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. White Russian.....	66	21	7. California Prolific Black.....	62	12
2. Wallis.....	65	2	8. Abyssinia.....	62	4
3. Columbus.....	64	19	9. White Schonen.....	61	26
4. Banner.....	63	19	10. American Beauty.....	61	16
5. Oderbruch.....	63	13	11. Golden Beauty.....	60	25
6. Early Blossom.....	62	17	12. Lincoln.....	60	25

An average crop of 62 bushels 31 lbs. per acre.

## INDIAN HEAD EXPERIMENTAL FARM, NORTH-WEST TERRITORIES.

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. Columbus.....	88	18	7. Early Golden Prolific.....	80	2
2. American Beauty.....	85	15	8. White Schonen.....	79	34
3. Holstein Prolific.....	84	26	9. Wide Awake.....	79	34
4. Abundance.....	82	4	10. Early Archangel.....	79	14
5. Golden Beauty.....	80	7	11. Bavarian.....	77	32
6. Abyssinia.....	80	5	12. Banner.....	77	1

An average crop of 81 bushels 10 lbs. per acre.

## BRANDON EXPERIMENTAL FARM, MANITOBA.

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. American Beauty.....	92	19	7. Bavarian.....	79	26
2. Banner.....	90	5	8. California Prolific Black.....	77	12
3. Holstein Prolific.....	81	23	9. Rosedale.....	77	7
4. Early Golden Prolific.....	81	1	10. Golden Beauty.....	75	12
5. White Schonen.....	80	27	11. Columbus.....	74	1
6. Golden Giant.....	79	29	12. Joannette.....	73	25

An average crop of 86 bushels 25 lbs. per acre.

## AGASSIZ EXPERIMENTAL FARM, BRITISH COLUMBIA.

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. Bavarian.....	60	22	7. Early Golden Prolific.....	55	33
2. Lincoln.....	60	6	8. Early Archangel.....	55	30
3. Early Gothland.....	59	27	9. Cream Egyptian.....	55	5
4. Early Blossom.....	56	17	10. Holstein Prolific.....	55	3
5. Banner.....	56	7	11. American Beauty.....	54	33
6. Columbus.....	56	7	12. Early Maine.....	54	16

An average crop of 56 bushels 26 lbs. per acre.

The twelve varieties of oats which have produced the largest average crops for the past four years on all the experimental farms, and hence may perhaps be regarded as worthy of being placed at the head of the list for general cultivation are the following:—

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. Banner.....	71	17	7. White Schonen.....	65	29
2. American Beauty.....	71	16	8. Early Golden Prolific.....	65	27
3. Columbus.....	70	5	9. Wallis.....	65	16
4. Golden Beauty.....	67	17	10. Abundance.....	65	9
5. Bavarian.....	66	33	11. Golden Giant.....	64	19
6. Holstein Prolific.....	66	18	12. White Russian.....	64	11

An average crop of 67 bushels 4 lbs. per acre.

The Improved Ligowo, which is also a very promising oat, averaged 64 bushels 6 lbs. per acre, within 5 lbs. per acre of the White Russian.

## FOUR YEARS' EXPERIENCE WITH VARIETIES OF BARLEY.

## TWO-ROWED BARLEY.

The six varieties of two-rowed barley which have averaged the heaviest crops at the several experimental farms during the past four years, are the following:—

## CENTRAL EXPERIMENTAL FARM, OTTAWA, ONT.

		Per acre.			Per acre.
		Bush. Lbs.			Bush. Lbs.
1. Beaver.....	42	9	4. Canadian Thorpe.....	40	15
2. Danish Chevalier.....	40	32	5. Sidney.....	39	38
3. Bolton.....	40	15	6. Newton.....	39	27

An average crop of 40 bushels 22 lbs. per acre.

## NAPPAN EXPERIMENTAL FARM, NOVA SCOTIA.

Per acre.			Per acre.		
Bush. Lbs.			Bush. Lbs.		
1. French Chevalier.....	36	12	4. Beaver.....	34	3
2. Danish Chevalier.....	35	25	5. Bolton.....	33	51
3. Newton.....	34	18	6. Prize Prolific.....	33	16

An average crop of 34 bushels 29 lbs. per acre.

## BRANDON EXPERIMENTAL FARM, MANITOBA.

Per acre.			Per acre.		
Bush. Lbs.			Bush. Lbs.		
1. French Chevalier.....	51	9	4. Newton.....	43	36
2. Sidney.....	48		5. Beaver.....	42	46
3. Thanet.....	44	28	6. Prize Prolific.....	39	47

An average crop of 45 bushels 4 lbs. per acre.

## INDIAN HEAD EXPERIMENTAL FARM, NORTH-WEST TERRITORIES.

Per acre.			Per acre.		
Bush. Lbs.			Bush. Lbs.		
1. French Chevalier.....	58	31	4. Prize Prolific.....	53	34
2. Danish Chevalier.....	56	22	5. Newton.....	52	6
3. Canadian Thorpe.....	54	29	6. Beaver.....	52	4

An average crop of 54 bushels 29 lbs. per acre.

## AGASSIZ EXPERIMENTAL FARM, BRITISH COLUMBIA.

Per acre.			Per acre.		
Bush. Lbs.			Bush. Lbs.		
1. French Chevalier.....	37	39	4. Beaver.....	35	12
2. Kinver Chevalier.....	36	45	5. Canadian Thorpe.....	34	10
3. Danish Chevalier.....	36	2	6. Prize Prolific.....	32	39

An average crop of 35 bushels 24 lbs. per acre.

The six varieties of two-rowed barley which have produced the largest crops for the past four years, taking the average of the results obtained on all the experimental farms, are :—

Per acre.			Per acre.		
Bush. Lbs.			Bush. Lbs.		
1. French Chevalier.....	36	26	4. Canadian Thorpe.....	34	10
2. Danish Chevalier.....	34	18	5. Newton.....	33	26
3. Beaver.....	34	17	6. Prize Prolific.....	32	14

An average crop of 34 bushels 10 lbs. per acre.

## SIX-ROWED BARLEY.

The six varieties of six-rowed barley which have averaged the heaviest crops at the several experimental farms for the past four years are the following :—

## CENTRAL EXPERIMENTAL FARM, OTTAWA, ONTARIO.

Per acre.			Per acre.		
Bush. Lbs.			Bush. Lbs.		
1. Odessa.....	57	12	4. Pioneer.....	51	39
2. Mensury.....	55	42	5. Stella.....	48	19
3. Royal.....	53	26	6. Trooper.....	48	17

An average crop of 52 bushels 26 lbs. per acre.



## NAPPAN EXPERIMENTAL FARM, NOVA SCOTIA.

Per acre.		Per acre.	
Bush. Lbs.		Bush. Lbs.	
1. Mensury.....	48 45	4. Surprise.....	41 42
2. Trooper.....	43 1	5. Pioneer.....	41 32
3. Oderbruch.....	42 44	6. Vanguard.....	40 30

An average crop of 43 bushels 8 lbs. per acre.

## BRANDON EXPERIMENTAL FARM, MANITOBA.

Per acre.		Per acre.	
Bush. Lbs.		Bush. Lbs.	
1. Common.....	56 7	4. Nugent.....	51 32
2. Trooper.....	55 2	5. Surprise.....	50 15
3. Mensury.....	54 30	6. Stella.....	49 23

An average crop of 52 bushels 42 lbs. per acre.

## INDIAN HEAD EXPERIMENTAL FARM, NORTH-WEST TERRITORIES.

Per acre.		Per acre.	
Bush. Lbs.		Bush. Lbs.	
1. Rennie's Improved.....	60 30	4. Mensury.....	57 24
2. Odessa.....	59 28	5. Baxter.....	55 40
3. Common.....	57 28	6. Trooper.....	55 30

An average crop of 57 bushels 38 lbs. per acre.

## AGASSIZ EXPERIMENTAL FARM, BRITISH COLUMBIA.

Per acre.		Per acre.	
Bush. Lbs.		Bush. Lbs.	
1. Oderbruch.....	33 34	4. Common.....	32 21
2. Mensury.....	33 1	5. Royal.....	32 12
3. Odessa.....	32 44	6. Trooper.....	31 1

An average crop of 32 bushels 27 lbs. per acre.

The six varieties of six-rowed barley which have produced the largest crops for the past four years, taking the average of the results obtained on all experimental farms are :—

Per acre.		Per acre.	
Bush. Lbs.		Bush. Lbs.	
1. Mensury.....	49 47	4. Common.....	45 24
2. Odessa.....	47 20	5. Royal.....	45 2
3. Trooper.....	46 29	6. Oderbruch..	44 44

An average crop of 46 bushels 27 lbs. per acre.

## FOUR YEARS' EXPERIENCE WITH VARIETIES OF SPRING WHEAT.

The twelve varieties of spring wheat which have averaged the heaviest crops, at the several experimental farms during the past four years, are the following :—

## CENTRAL EXPERIMENTAL FARM, OTTAWA, ONTARIO.

Per acre.		Per acre.	
Bush. Lbs.		Bush. Lbs.	
1. Preston.....	26 3	7. Stanley.....	22 41
2. Colorado.....	23 59	8. Pringle's Champlain.....	22 33
3. Goose.....	23 51	9. Huron.....	22 27
4. Wellman's Fife.....	23 46	10. Progress.....	21 41
5. Rio Grande.....	23 37	11. Vernon.....	21 41
6. Monarch.....	23 24	12. Advance.....	21 20

An average crop of 23 bushels 5 lbs. per acre.

3—8½

## NAPPAN EXPERIMENTAL FARM, NOVA SCOTIA.

	Per acre. Bush. Lbs.		Per acre. Bush. Lbs.
1. Wellman's Fife.....	32 44	7. Goose .....	29 50
2. Stanley .....	31 5	8. White Russian.....	29 5
3. White Connell.....	30 55	9. Rio Grande .....	29 ..
4. Preston.....	30 45	10. Old Red River.....	28 55
5. Red Fern.....	30 35	11. Advance.....	28 35
6. Huron .....	30 10	12. Admiral.....	27 20

An average crop of 29 bushels 5 lbs. per acre.

## BRANDON EXPERIMENTAL FARM, MANITOBA.

	Per acre. Bush. Lbs.		Per acre. Bush. Lbs.
1. White Fife.....	39 5	7. White Connell.....	34 57
2. Goose .....	38 7	8. Pringle's Champlain.....	34 43
3. Red Fife .....	36 50	9. Rio Grande.....	34 28
4. Preston.....	36 41	10. Old Red River.....	33 35
5. Monarch.....	36 25	11. White Russian.....	33 2
6. Crown.....	35 27	12. Wellman's Fife.....	32 25

An average crop of 35 bushels 29 lbs. per acre.

## INDIAN HEAD EXPERIMENTAL FARM, NORTH-WEST TERRITORIES.

	Per acre. Bush. Lbs.		Per acre. Bush. Lbs.
1. Red Fife.....	42 7	7. Percy.....	40 57
2. Emporium.....	42 3	8. Crown.....	40 52
3. Beaudry.....	41 48	9. Wellman's Fife.....	40 50
4. Preston.....	41 25	10. Red Fern.....	40 10
5. Huron.....	41 22	11. Stanley.....	39 10
6. White Fife.....	41 2	12. White Connell.....	39 2

An average crop of 40 bushels 53 lbs. per acre.

## AGASSIZ EXPERIMENTAL FARM, BRITISH COLUMBIA.

	Per acre. Bush. Lbs.		Per acre. Bush. Lbs.
1. White Fife.....	26 31	7. Old Red River.....	25 25
2. Preston.....	26 30	8. Wellman's Fife.....	25 15
3. White Connell.....	26 20	9. Alpha.....	25 1
4. Red Fife.....	26 11	10. Monarch.....	24 45
5. Herisson Bearded.....	26 2	11. Campbell's White Chaff.....	24 45
6. Rio Grande.....	25 50	12. Admiral.....	24 35

An average crop of 25 bushels 35 lbs. per acre.

The twelve varieties of spring wheat which have produced the largest crops, taking the average of the results obtained on all the experimental farms for the past four years, are :—

	Per acre. Bush. Lbs.		Per acre. Bush. Lbs.
1. Preston.....	32 17	7. White Connell.....	30 19
2. Wellman's Fife.....	31 ..	8. Rio Grande.....	30 1
3. Monarch.....	30 58	9. Goose.....	29 58
4. Percy.....	30 24	10. Red Fern.....	29 17
5. Red Fife.....	30 23	11. Old Red River.....	29 17
6. White Fife.....	30 20	12. Advance.....	29 8

An average crop of 30 bushels 17 lbs. per acre.

The cross-bred variety Stanley came within 5 lbs. of Advance, having averaged 29 bushels 3 lbs. for the four years.

## THREE YEARS' EXPERIENCE WITH VARIETIES OF PEASE.

The twelve varieties of pease which have averaged the heaviest crops at the several experimental farms for the past three years, are the following :—

## CENTRAL EXPERIMENTAL FARM, OTTAWA, ONTARIO.

		Per acre.		Per acre.	
		Bush.	Lbs.	Bush.	Lbs.
1. Arthur .....	41	22	7. Canadian Beauty .....	35	30
2. Macoun .....	39	10	8. Bedford .....	35	27
3. Kent .....	37	23	9. Creeper .....	35	22
4. Agnes .....	36	26	10. Duke .....	35	17
5. Mackay .....	36	15	11. Crown .....	35	15
6. Black-eyed Marrowfat .....	36	12	12. Paragon .....	34	47

An average crop of 36 bushels 32 lbs. per acre.

## NAPPAN EXPERIMENTAL FARM, NOVA SCOTIA.

		Per acre.		Per acre.	
		Bush.	Lbs.	Bush.	Lbs.
1. Crown .....	47	..	7. Large White Marrowfat .....	33	50
2. Centennial .....	36	40	8. Carleton .....	33	10
3. Pride .....	36	33	9. Bedford .....	32	10
4. Black eyed Marrowfat .....	36	26	10. Prince .....	32	10
5. New Potter .....	33	53	11. Prince Albert .....	31	33
6. Creeper .....	33	50	12. Paragon .....	30	50

An average crop of 34 bushels and 50 lbs. per acre.

## BRANDON EXPERIMENTAL FARM, MANITOBA.

		Per acre.		Per acre.	
		Bush.	Lbs.	Bush.	Lbs.
1. Pride .....	52	35	7. Crown .....	44	32
2. Mummy .....	48	32	8. Black-eyed Marrowfat .....	44	..
3. New Potter .....	48	30	9. Trilby .....	43	46
4. Carleton .....	46	33	10. Prince .....	41	26
5. Kent .....	45	40	11. Agnes .....	40	53
6. Mackay .....	44	53	12. Prince Albert .....	40	13

An average crop of 45 bushels 8 lbs. per acre.

## INDIAN HEAD EXPERIMENTAL FARM, NORTH-WEST TERRITORIES.

		Per acre.		Per acre.	
		Bush.	Lbs.	Bush.	Lbs.
1. Paragon .....	43	23	7. Golden Vine .....	37	22
2. Trilby .....	42	53	8. Centennial .....	37	20
3. Carleton .....	40	30	9. New Potter .....	36	20
4. Crown .....	39	26	10. Pride .....	36	..
5. Duke .....	38	36	11. Mackay .....	35	33
6. Prince .....	38	3	12. Creeper .....	34	46

An average crop of 38 bushels 12 lbs. per acre.

## AGASSIZ EXPERIMENTAL FARM, BRITISH COLUMBIA.

		Per acre.		Per acre.	
		Bush.	Lbs.	Bush.	Lbs.
1. Arthur .....	28	53	7. New Potter .....	23	32
2. Creeper .....	25	53	8. Centennial .....	22	45
3. Prince Albert .....	25	46	9. Kent .....	22	13
4. Carleton .....	24	50	10. Paragon .....	22	7
5. Macoun .....	24	46	11. Crown .....	21	51
6. Multiplier .....	23	55	12. Golden Vine .....	21	27

An average crop of 23 bushels 59 lbs. per acre.



The twelve varieties of pease which have produced the largest crops taking the average of the results obtained on all the experimental farms, for the past three years, are :—

		Per acre.				Per acre	
		Bush.	Lbs.			Bush.	Lbs.
1. Crown.....	37	36	7. Centennial.....	33	47		
2. Carleton.....	35	49	8. Paragon.....	33	40		
3. Pride.....	35	16	9. Creeper.....	33	26		
4. New Potter.....	34	57	10. Trilby.....	33	16		
5. Prince Albert.....	33	49	11. Duke.....	33	14		
6. Arthur.....	33	47	12. Kent.....	33	11		

An average crop of 34 bushels 19 lbs. per acre.

*By Mr. Clancy :*

Q. You might say what varieties of oats were first, second and third?

A. In oats Banner stands at the head of the list at the Central Farm, Golden Beauty second, and American Triumph third. At Nappan, White Russian stands first, Wallis stands second, and Columbus third, with Banner fourth. I might say that the White Russian is a variety which has usually succeeded well in the maritime provinces and to some extent over the whole Dominion.

*By Mr. Rogers :*

Q. Do you judge oats by weight or by measure?

A. By weight.

*By Mr. Calvert :*

Q. Are these the samples of those kinds which you have here?

A. Not all of them, we have the Banner here. These are samples brought to show the kind of grain we have been sending out for sowing on the one-tenth of an acre plots, 14 sorts in all; these are also intended to show how we clean the grain before sending it out for sowing. You will observe that the grain is mostly large and plump and quite clean.

*By Mr. Semple :*

Q. How does White Russian do at the Experimental Farm?

A. White Russian does very well, it stands ninth here on the list of the best twelve. In Manitoba the American Beauty oat stands at the head of the list although at Ottawa it stands twelfth. It should be borne in mind that in arranging these plots at Ottawa there is no variety favoured, no effort made to put this or that sort on the best spot. Our land here is not very uniform in quality, and sometimes a variety which has done well one year drops out of the list of the best sorts the next year for the reason that it has been sown on a poorer piece of ground. Sometimes the best varieties suffer from being sown in very exposed positions. This was the case with the Banner oat at Indian Head in 1897. The plot on which it was sown was very much exposed to strong winds which blew out a portion of the seed and exposed the roots of the plants so that they were much injured. That plot produced only 52 bushels 2 lbs. per acre, whereas another plot near by on the same land but sheltered from wind by a belt of trees gave from the same seed 101 bushels 16 lbs. per acre. There are thus many factors which influence the results, and it is not to be expected that the same varieties will be found in the same position on the list every year. All the varieties are exposed to like conditions and the results obtained, whether favourable or unfavourable, are honestly and fully stated.

*By Mr. Clancy :*

Q. Would that not rather suggest that the tests made there are not altogether reliable, for the reason that it depends on the character of the soil rather than on the

grain itself? For instance, you have spoken of the inequalities of the land at the farm and you are not able to make true tests?

A. I do not admit that we cannot make true tests, but we must admit that differences in soil and climate materially affect the crops. Now, notwithstanding that the Banner dropped out of the list of the best 12 sorts in 1897 at Indian Head, it did so well over the whole Dominion that it stands at the head of the list at all the farms after four years' trial. We should not lay too much stress on the results of any one year but take the average for several years, the longer the time the more reliable are the results. The average results of four years shows that 11 of the 12 varieties which were best in 1897 over the whole Dominion were included in the best 12 for 1898, showing that there is inherent productiveness in varieties, and that this productiveness is to a large extent a fixed and permanent characteristic.

Q. What I am endeavouring to find out is this, that while it stood low you tried to account for it by conditions that prevailed, the character of the soil or the action of the wind, which prevented it attaining to the position it should?

A. Yes, that is quite true, the unfavourable conditions referred to were clearly the cause of the small crop in that case, but the large crop produced from the same seed near by showed clearly that the Banner oat was not lacking in productiveness. But there are other conditions, especially when the grain is flowering, which sometimes injure the crop which are not so easily traced. When wheat is in flower, and the pistil and stamen are soft and glutinous if the weather is unusually hot and the sun shines strongly it may strike through the two layers of chaff which covers the seed with so much heat as to wither the organs and destroy or injure the immature grain. What we want to get at in all these cases is the truth, not to recommend any special varieties, but to give the results of the crops in bushels per acre and let farmers judge for themselves as to the varieties most likely to give them satisfaction. The strongest recommendation I have given to any variety will be found in the paragraph in bulletin 32 dealing with the 12 varieties of oats which have produced the largest average crops for the past four years on all the experimental farms. I said that "for the reason they have produced these large crops they may perhaps be regarded as worthy of being placed at the head of the list for general cultivation." That is not a strong statement, the reason for the opinion is given in bushels per acre the farmer is left to exercise his own judgment. In all cases much more dependence can be placed on the results of four or five years experience than on the crops of any one year.

*By Mr. McMillan :*

Q. In grain cut for seed is great care taken to cut them all at the same stage of ripeness?

A. Great care is taken in reaching conclusions on that question. The farm foreman watches every day for the exact time when the cutting should take place. And if the crop is not cut that day, the date when it is ripe for cutting is entered and this is given as its time of ripening. The farm foreman at the Central Farm is a good practical farmer who has had a long experience, and I would rather trust in his judgment on this point than in my own. It is the same on the branch farms. The superintendents there have had long experience and are very reliable men, and their judgment is taken as regarding the time of ripening of all the different varieties.

*By Mr. Stenson :*

Q. What is the consequence if grain is not cut at the proper time?

A. In some instances when crops are not cut promptly they shell badly and if left for several days after the grain is ready for harvesting much waste would occur and part of the crop would be on the ground.

Q. But as regards its usefulness for seed?

A. That would not be affected if the grain is fully ripened.

Q. But if it's not perfectly ripe will its reproductive properties be destroyed?

A. If cut very green there is little doubt that its germinating power is injured, but if it is cut within a few days of ripening and allowed to stand for a time on stock it matures fairly well. As a rule, however, plump and well ripened grain will produce the best results. When grain is cut too early it is not as valuable commercially. We had a singular experience at the Indian Head farm in 1891, when there was much frosted wheat in the country and its usefulness for seed was very doubtful. Plots of the same size were sown with good plump seed of Red Fife wheat and with Nos. 1, 2 and 3 frosted. The No. 3 was so poor in quality and shrivelled that it was considered only fit for chicken feed, yet it gave a crop of  $5\frac{1}{2}$  bushels per acre more than was had from the good plump seed. The plump seed gave 32 bushels 40 pounds, and the poor shrivelled grain yielded 30 bushels 10 pounds per acre. I do not think such a result as this could be had on any but very rich soil. The germ of the wheat is very small and is embedded in one end of the kernel and if the kernel is large it affords a large amount of food to the plant in its early stage of growth. But there its usefulness ends, and after it has consumed that food the plant must then take its nourishment from the soil. In the shrivelled seed there was enough food to give the plants a start and after that plenty of food was found in the soil to give it vigour and produce rapid growth. I don't think we would get the same results here where the soil has not the same amount of plant food. These results show, however, that you can lay down no rigid rules in this matter which will be applicable to every case, because climate, soil and other factors influence plant growth so largely.

*By Mr. Calvert :*

Q. How do you harvest these plots?

A. We cut them by hand.

Q. Do you keep them separate?

A. Yes. They are kept separate and threshed separately.

Q. How do you thresh them?

A. We have a special small machine for threshing the crops from these plots, which is easily opened so that every kernel can be cleaned out. Careful arrangements are made to prevent any mixing of the seeds of the different varieties.

Q. Is there no danger of a mixture in the threshing machine?

A. No. Every time a threshing is completed the machine is taken apart and thoroughly cleaned before the next variety is put in.

Q. Do you thresh the grain as soon as it is brought in?

A. As soon as we can, but as we usually have 500 or more of different plots every year we cannot always thresh as fast as the grain is ready, but we do it as rapidly as we can.

Q. It must take a lot of room to store the different crops until you can thresh them?

A. That is so; and we endeavour to thresh as large a number as we can, as they come in from the field.

*By Mr. Clancy :*

Q. What space do you leave between each plot?

A. There is three feet of space allowed between each plot.

Q. Would that have any tendency to effect the variety?

A. No, not the slightest. The flowers of wheat, barley and oats are fertilized by their own pollen. The flower case is so tightly closed that there is no chance of the access of any foreign pollen, unless the spikelet is torn open or eaten by an insect which is a very rare thing indeed. In the ordinary course of nature there is not the slightest danger of any one variety affecting any other sort by cross-fertilizing, from being grown near together.



*By Mr. Featherston :*

Q. It is different with corn?

A. Yes, it is a very different thing with corn where the fertilizing is effected openly. The corn pollen which is formed on the tassel drops on the silk and sends a little fibre out which penetrates the thread of silk and descends to the ovary and there fertilizes the seed, but in the case of wheat, barley and oats, there is no danger of that, as every kernel is fertilized by its own pollen and that in and in breeding is probably one of the chief reasons why some varieties so soon die out. A few years ago I examined a large number of samples of different varieties of wheat which had been exhibited at the Centennial Exhibition, and I was surprised to find that of all the varieties then exhibited very few are now known. Red Fife is a remarkable example of the power of some varieties to maintain their vigour and productiveness for a long period; this originated in 1842, and it is still one of our most vigorous and productive sorts especially in the North-west. So one cannot lay down any law in regard to the length of life of any of these varieties. It may be that the change of the seed of Red Fife from one part of the Dominion to the other—that is from Ontario to Manitoba—has exercised a very great influence upon this variety. I think it is the duty of the Agricultural Department of every government to look ahead in this matter of varieties so that new and vigorous sorts may be available to replace any that may run out and cease to be profitable.

*By Mr. Parmelee :*

Q. You would recommend the frequent change of seed?

A. Yes, I think it is an advantage, although as I said at the last meeting it is one of those things the advantage of which it is difficult to furnish actual proof. This practice is, however, held to be beneficial by most intelligent farmers, over the whole world, and this general consensus of opinion based on experience may safely be regarded as well founded.

*By Mr. Calvert :*

Q. Would you consider that good proof?

A. Fairly good, but not as good as can be furnished in support of many other questions bearing on profitable farming. A man may believe that all the advantage he gets in crop is due to this one cause, whereas one-half or two-thirds of it may be dependent on other circumstances. I believe in the desirability of change of seed from one place to another, and from time to time from one soil to another, and have practised this more or less for many years in connection with the work of the experimental farms.

*By Mr. Pettet :*

Q. Do you sow your own seed?

A. We do very often, and we often send seed grain to the branch farms, and they in return send seed here for a change. We sent this year to Nappan seed from Ottawa of all varieties of wheat they required. Their wheat this year was shrivelled on account of rust. The superintendents of the branch farms at Brandon and Indian Head and Agassiz exchange seed whenever they think it is desirable, and I have always instructed them to carry out whatever they think best in this matter, but we have not pursued any special line of investigation with the object of ascertaining the effect on crops of such changes of seed. I have regarded this practice as one which was everywhere recognized as beneficial.

Q. You cannot tell how long you have sown any particular kind of seed?

A. Yes, we have the number of years all on record on our books. The branch farms have received all their seeds at the start from Ottawa, so all had the same strain

at the beginning. The results we have published in the growing of varieties are in most cases the crops obtained from successive sowings from year to year of seed grown on the same farm ; occasional changes have been made, but our uniform test plots have only been carried on for five or six years, and this is but a short time in the life of any good variety of seed.

*By Mr. Semple :*

Q. Haven't you brought any seed grain from foreign countries ?

A. Yes, from almost every foreign country, and we have been growing these in comparison with other new varieties which have been introduced, and some which have been originated here. We have had them from Russia, Japan, Australia, New Zealand, also from England and France, and many other countries. A number of varieties have been discarded after two or three years of trial, because they were of such poor quality that it was not worth while to continue them. This was especially the case with some varieties from the south of Europe, the Trimenian Sicilian, the Medea, and the Greek summer wheats from Southern Europe. These were all much like goose wheat, translucent with very little gluten, and were manifestly inferior. We have selected the best and kept these on, and have found the number quite large enough. With all the weeding out we have done, there are still a very large number of varieties to look after, there are over 700 plots this year at the central farm to take records of.

*By Mr. Clancy :*

Q. Did you say that the varieties you sent out are hybrids ?

A. The four varieties of wheat sent out for the special test in one-tenth acre plots were all cross-bred sorts. They are all crosses between Red or White Fife and the Ladoga, the Ladoga blood being introduced to try and produce earliness in connection with the vigour and productiveness of the Fife.

Q. What is your experience with regard to the productiveness of these hybrids ?

A. I have already given examples. One of these, the Preston wheat, has produced as the average of four years' trial on all the experimental farms, one bushel and 17 pounds, more than any other variety tested.

Q. That may be considered a proof then, that instead of keeping the same seed continually it is well to change occasionally ?

A. That, I think, is the indication.

*By Mr. Featherston :*

Q. By the continuous growing of many samples of many seeds upon the farm do you find they have decreased in yield ?

A. Our experience is too short to expect that. We find a difference in yield in different seasons and in different climates, but have not observed any regular decrease in productiveness in any of these varieties.

*By Mr. McMillan :*

Q. In the varieties that you have brought over from other countries, have you found them to improve after two or three years here ?

A. I can scarcely answer that question directly in a way that would be strictly fair to the varieties referred to. Take for example the Indian varieties of seed grain which we got from high altitudes in the Himalayas, through instructions from Lord Dufferin seven or eight years ago, some of them coming from an altitude of 11,000 feet. The methods of agriculture practised in India are so poor that the crops are very small, their best results being from 8 to 10 bushels to the acre. Where a variety has been grown for several hundred years under such conditions, and is then brought to a new country where the soil contains an abundance of plant food, there is bound to be an increase. These varieties did produce larger crops, but not large enough to compare favourably with the varieties in common cultivation here, and after trying them for

several years, most of them were discontinued, but we have used them to cross fertilize other varieties with, because they are so much earlier. In the case of the Ladoga wheat, I do not think that has given us, during the last three or four years, as large crops on the average as it did during the first two or three years after it was introduced, but in some districts it continues to do very well. A gentleman recently told me that north of Edmonton he had seen, last year, one of the finest fields of wheat he ever saw, the Ladoga was the variety he spoke of; it stood, he said, as high as his head and produced a splendid crop. I have also had reports from Indian agents from Indian reserves in the far north, praising this variety, showing that climate has a great deal to do with the usefulness of some of these sorts.

*By Mr. Parmalee :*

Q. Is Ladoga not a good milling flour?

A. It produces flour of good quality, and good bread is made from it, but the flour having a yellowish colour, this is an objection to it, and we do not want to encourage the growing of any variety which is likely to lessen the reputation of our Canadian flour.

The next series of tables give the six best varieties of six-rowed and two-rowed barley, at each farm, and the six best sorts at all the farms, and the twelve best varieties of spring wheat in the same way. Permit me to point out how the Preston wheat stands at the different places. It stood at the head at Ottawa, last year, with a yield of 26 bushels 3 pounds per acre, the next variety giving 23 bushels 59 pounds, a difference in favour of Preston of 2 bushels and 4 pounds per acre. At Indian Head, Preston stood fourth on the list with a yield of 41 bushels 25 pounds, at Nappan it was fourth on the list with 30 bushels 45 pound. At Brandon it was fourth on the list with 36 bushels 41 pounds. I may say that the three or four varieties at the head of each list come very close to each other in yield, so that a little waste in harvesting might cause some to change places. In British Columbia, Preston stood second with 26 bushels and 30 pounds. In this instance you have a variety tested over the whole Dominion in many climates, ranking not lower anywhere than fourth in the lists of the twelve best varieties.

*By Mr. Rogers :*

Q. Is it a good milling wheat?

A. We believe it is, although that has not yet been tested, we have sent samples to London, England, to the High Commissioner for Canada, to get the opinions of experts on the quality of that wheat, but have not yet heard the results. Our millers here require a carload of the grain to make a satisfactory test, and as yet it has not been possible to procure that quantity. I have also given you the result of three years' experience with varieties of pease.

*By Mr. Clancy :*

Q. Would you give us the varieties of pease?

A. Do you want the twelve varieties or a less number of those giving the larger crops?

Q. What would be the general yield?

A. The results of the test of the 12 varieties at all the farms places Arthur, which is a cross-bred variety, at the head of the list with 28 bushels 53 pounds as the average yield of four years. The Creeper which is a very small pea and not of much value for marketing, but good for feeding, stands second with 25 bushels 53 pounds, this gives a clear gain to the Arthur of 3 bushels to the acre. Prince Albert stands third with 25 bushels 46 pounds. Next in the list are two other cross-bred sorts, Carleton and Macoun. Multiplier stands sixth with 23 bushels 55 pounds. New Potter and Centennial next, these are two commercial varieties, Kent is a new cross-bred sort, Paragon, Crown and Golden Vine, are old and well-known varieties. These are the 12 which did best on all the Experimental Farms.



*By Mr. Semple :*

Q. How did the variety Arthur do at the Central Farm ?

A. The variety Arthur at the Central Farm stands at the head with 41 bushels 22 pounds. We have sent out a good many samples of this pea to farmers and two years ago a bushel was sent to several of the leading Canadian seedsmen who are now growing this variety for sale, and they are all pleased with the crops they have had from it.

*By Mr. Calvert :*

Q. You said that the average of oats on the farm during 1889-90-91 was slightly over 32 bushels to the acre, and in 1896-97-98 it was 56 bushels, or a difference between the two periods of 23 bushels 56 pounds ; how do you account for that ?

A. By our having practised what we have been teaching, by improving the land, adding to its fertility by yearly applications of barn-yard manure and the ploughing under of green clover, by thoroughly preparing the soil for the seed and attending to underdraining, which is very important. By selecting the best varieties of seed and thoroughly cleaning them so to sow only plump and well ripened grain, and the seed is sown at the proper time, that is as early as possible. We think it pays us, if we are rushed with work, to hire extra teams in order to get the seed in as early as possible. As already stated a delay of a week beyond the proper time will cause a loss of ten or fifteen per cent, and a delay of two weeks will often cause a loss of twenty-five to thirty per cent. It is by putting into practice what we have been teaching along all these different lines that we have brought about these increased crops on the Central Farm.

*By Mr. McMillan :*

Q. You mentioned a while ago that you were sending out 8 lb. samples of oats for  $\frac{1}{10}$  acre plots, that is 2 bushels 12 lbs. to the acre ; is that not rather much ?

A. After careful consideration of this matter it was thought best to send out that quantity of oats. Seven pounds would have been sufficient on the basis of two bushels per acre, the extra pound was sent to provide against any little accidental waste in seeding which might occur. The same was done with the wheat and barley, and 10 pounds was sent.

Q. I think if you put 2 bushels and 12 pounds of oats where 2 bushels would with care have been sufficient, on good land it is too much. You supply 8 pounds for  $\frac{1}{10}$  of an acre, which is 80 pounds to the acre. Two bushels are 68 pounds and you have 12 pounds over ?

A. I admit that this is a larger amount of seed than we sow in Ottawa, but in the maritime provinces farmers frequently sow  $2\frac{1}{2}$  and 3 bushels to the acre. Had we sent the exact quantity it would to some farmers appear very niggardly.

*By Mr. Clancy :*

Q. You said you had sent the Preston wheat to some of the seedsmen ?

A. Yes.

Q. Have you ever found that some seedsmen are not so cautious as those of the heads of the farms about new varieties ; they are sometimes disposed to boom such things under new names ?

A. I know that is sometimes the case, but we have only sent this grain to a few of our most reliable seedsmen. If we withheld these new sorts and did not take any steps to make them available to the public we might be blamed for this. These seedsmen have sent the samples to special farmers to grow and as soon as a sufficient quantity is available the seed will be sold to those who want to buy them.

Q. We have known seed to be greatly boomed that is worthless ?

A. We find every year that some seedsmen bring out old varieties and give them new names, and we have to undertake the work of growing these alongside of other

varieties with which they are identical in order to prove their identity. I do not think however, that there is the slightest danger of anything but straightforward dealing by the seed firms in whose hands these seeds have been placed.

#### THE FEEDING OF STEERS AND SWINE.

Early in the winter of 1898-99 a series of experiments was undertaken in connection with the fattening of steers. 36 animals were procured for the purpose and divided into nine groups of four each. These feeding tests were only partly completed under my charge when Mr. T. H. Grisdale was appointed as agriculturist. This work was at once handed over to him and the result of these tests will no doubt be given in his evidence. Some experiments were made with swine which were completed before Mr. Grisdale's appointment, these will now be referred to. The pigs, in this case, consisted of five lots of four each. No milk was given in any case to any of these swine, they were fed entirely on mixtures of whole and ground grain. The mixture consisted of equal parts of oats, barley and pease, with half a part of bran, and this was fed either whole or ground, dry or soaked.

#### FED ON A MIXTURE OF WHOLE GRAIN DRY.

Lot No. 24 was fed on a mixture of whole grain dry, and as much was given to the swine as they would eat up clean. Water was supplied freely in a separate trough. The pigs in this pen consisted of two Polan China sire, with Tamworth dam, one Tamworth sire and Chester white dam and one Polan China sire and Yorkshire dam. The four pigs at the outset weighed an average of  $67\frac{1}{2}$  lbs. each. These were rather smaller than those we usually select for such experiments. We generally have them to weigh from 70 to 80 lbs. The feeding test began on the 20th of July, and was continued for 14 weeks until the 26th of October. At the conclusion of the experiment the pigs weighed  $175\frac{1}{2}$  lbs. each, and 4.08 lbs. of grain was consumed for each lb. of increase in live weight.

*By Mr. Semple :*

Q. What was the daily increase in live weight ?

A. We did not take their weight daily, but weighed them every fortnight, the average gain per day can be easily calculated from the figures given.

*By Mr. Rogers :*

Q. That was a little over a pound a day ?

A. I have not figured it out, but I can do that for you if desired.

*By Mr. Clancy :*

Q. I heard a man speaking the other day who said that he was able to make  $3\frac{1}{2}$  lbs. daily ?

A. We have succeeded in occasionally getting three pounds daily increase with steers; but have not succeeded in making so rapid an increase in pigs. It would be interesting to get fuller information from that gentleman on this subject.

I gave him my address because I was anxious to hear the particulars, but I have not heard from him yet.

#### FED ON A MIXTURE OF WHOLE GRAIN SOAKED.

Lot 25 was put on the same mixture of whole grain, soaked on an average for 30 hours in cold water before feeding. It consisted of four cross-bred swine of exactly the same breeding as lot 24. The swine received of this soaked grain all they would eat up.

clean. This lot averaged  $65\frac{3}{4}$  lbs. each at the start, and at the close of the experiment they weighed 195 lbs. each. The quantity of grain used to produce each pound of increase in weight in this case was 3.56 lbs.

#### FED ON A MIXTURE OF GROUND GRAIN DRY.

Lot 26 consisted of four cross-bred pigs of exactly the same breeding as lots 24 and 25. These were fed for the same period and on the same mixture of equal parts of oats, barley and pease, with half a part of bran, but in this case the grain was ground and fed dry. The pigs were given all of this mixture they would eat up clean, and they had all the water they required in a separate trough. The pigs in this lot weighed at the beginning  $68\frac{3}{4}$  lbs. each, and at the close of the experiment, 195 lbs. each, and the quantity of grain used to produce each pound of increase in live weight was 3.56 lbs.

#### FED ON A MIXTURE OF GROUND GRAIN SOAKED.

Lot No. 27 consisted of four cross-bred pigs of exactly the same breeding as the other pens. These had an average weight of  $66\frac{1}{2}$  pounds each at the beginning and  $109\frac{1}{2}$  at the end. They were fed for fourteen weeks, and consumed 3.76 pounds of grain for each pound of gain live weight.

MR. PARMALEE—Soaking does not appear to have done much good.

*By Mr. Clancy :*

Q. Will you give us the different average increase on the different mixtures?

A. The average quantity of food consumed for each pound of increase in live weight was as follows : For the first lot 4.08, for the second lot 3.88, the third lot 3.56, and the fourth lot, 3.76.

*By Mr. Featherston :*

Q. I thought the quotation was  $3\frac{7}{16}$ .

A. No. It was  $3\frac{7.6}{100}$ .

*By Mr. Clancy :*

Q. Were they all the same age?

A. They were all the same age in the four pens, and of the same breeding.

#### FED ON A MIXTURE OF GROUND GRAIN SOAKED, WITH CLOVER ADDED.

The last lot of pigs fed, lot 28, were fed with the same mixture of grain ground and soaked in cold water for thirty hours, and one-third of the weight of green cut clover was added to the ration. This lot consisted of one Polan China sire and Tamworth dam, one Tamworth sire and Chester White dam, one Polan China sire and Yorkshire dam and one pure Tamworth. These weighed on an average  $68\frac{1}{4}$  pounds at the beginning and  $136\frac{1}{4}$  pounds at the close. The weight of these at the finish was much less than that of the others. They did not consume the same weight of food nor make the same growth or progress in weight that the others made which were not getting clover.

*By Mr. Featherston :*

Q. That was the average?

A. The increase at the close of the experiment showed that 3.60 pounds of meal and 1.20 pounds of clover had been consumed for each pound of gain. This experiment was included in the list last year because the suggestion was made by some gentleman in the committee that clover should be tried with the grain. Was it you, do you remember, Mr. McMillan?



Mr. McMILLAN.—I should not wonder if it was me, because we have been feeding clover and have been turning out sixteen pigs a month with very good results.

A. The clover was dried and soaked and put in with the grain. It may have been the fault of the pigs that progress was so slow, but that is the result we had. They weighed 13½ pounds each at the close of the experiment, and had consumed nearly as much grain as lot 27, and they ate the clover in addition. One object in feeding the clover was to gain information as to whether it had anything to do with the softening of pork, but when killed no difference could be seen as to the hardness of the fat.

*By Mr. Featherston :*

Q. Was the pork of all this lot good?

A. The pork of all these was pronounced to be good. The Poland China cross would not come into the first-class because the fat was more than 1½ inches through along the back. The pure Tamworth was a little soft, but in justice to the breed it must be said that this was a stunted little pig in the litter which had not been thought good enough to sell for breeding and hence it was put into this experimental feeding test.

Q. That is the great trouble with this soft pork, it comes from unhealthy hogs.

MR. McMILLAN—In fact it is from the hogs that do not thrive when young.

*By Mr. Featherston :*

Q. You found as a result that the dry feeding is the most profitable.

A. That was the case with the ground grain, but the whole grain gave the best result when soaked.

*By Mr. Rogers :*

Q. Had you an opportunity of feeding with whey and milk?

A. We have had much experience in feeding skim-milk, and in all cases where two or three pounds of milk has been given to each hog per day, the results in increase in weight and thriftiness of growth have been very satisfactory.

Having read over the preceding transcript of my evidence, I find it correct.

WM. SAUNDERS,

*Director, Dominion Experimental Farm.*

## COMMITTEE ROOM 46,

HOUSE OF COMMONS, 13th June, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 a.m., Mr. Bain, chairman, presiding.

THE CHAIRMAN.—We have present with us to-day Dr. Saunders, who desires to speak on the work of the outside Experimental Farms that are scattered over the various provinces in the Dominion.

## THE STOCK ON THE CENTRAL FARM.

DR. SAUNDERS.—MR. CHAIRMAN AND GENTLEMEN.—Before beginning what I have to say on the work of the branch Experimental Farms I wish to refer to one matter on which I wanted to speak in connection with our Central Farm work, that is our entire freedom now from tuberculosis. The cattle at the Central Experimental Farms were all tested with tuberculin in October last, and no case was found where there was any suspicious reaction. The cattle were tested also at the branch experimental farms, and at Nappan, N.S., Brandon, Man., and Agassiz, B.C., no cases were found, but at Indian Head two animals out of fifty-two tested gave a reaction. These were killed and found to be slightly affected. It is gratifying to know that we are now practically free from that disease.

*By Mr. McMillan :*

Q. Did you think there was any particular reason why your cattle should be affected?

A. The only reason I can assign for it is this, that we bought cattle from at least two different points from herds which we afterwards found were affected. These animals were examined before purchase by veterinary experts and pronounced sound. This is a very insidious disease and spreads rapidly, especially where cattle are kept in close quarters. I am of opinion that where cattle are watered from a common trough the disease may be spread in this manner. The sputa often contains the germs of this disease and these may be taken in by another animal drinking from the same receptacle. This plan of watering the cattle was used at the Central Farm, but as soon as we realized the possibility of danger from this source the troughs were abolished. It is also probable that the experiments conducted for four years in trying to feed thirty cows on forty acres of land, had a tendency to spread the disease as these cattle were housed together for the greater part of this time.

*By Mr. Sproule :*

Q. Were these common troughs for water used in the barn?

A. Yes.

*By Mr. McMillan :*

Q. It is a trough running from one to the other.

A. Yes. These troughs were emptied and brushed once a day, but still there was a chance of the disease germs passing from one animal to another in this way.

*By Mr. Wilson :*

Q. How do you do it now?

A. We water them separately. We expect shortly to introduce a device which our agriculturist, Mr. Grisdale, is working out by which each animal can be watered separately without carrying water to each.

Q. That is a little more trouble?

A. Yes. We water with pails now and shall continue to do so until we get the watering device referred to completed.

*By Mr. Moore :*

Q. I think the farmers do not understand this tuberculin matter, where it is to be got and how administered. It might be well to give a little explanation which would go out in your evidence?

A. I shall be glad to do that. The tuberculin is obtained by making cultures of the bacillus which causes the disease. These give off a peculiar secretion during their growth, which is retained in the tuberculin, and when this is injected into animals affected with the disease it causes a rise in the temperature of from two to five or six degrees above normal in a few hours, and it is by that rise in temperature that the presence of the disease is detected. In connection with the tests made at the several Experimental Farms, we have killed a considerable number of animals and there is only one instance which I can recall where this reaction occurred where the disease was not found. That was a young bull whose sire and dam were both diseased, and on this account as the bull was of no value the examination made was done with less care than in other cases, and that is the only case I can recollect where we did not find the disease clearly marked.

*By Mr. McMillan :*

Q. Is it possible for an animal to show reaction that has not the disease?

A. It has been said so, but it can scarcely be proven that such animals have not the disease unless every part of their organism is examined, and this it is very difficult to do. There is a very strong belief among veterinarians all over the world that this is a reliable means of diagnosing the disease. The tuberculin when prepared is injected under the skin of the animal and the thermometer is placed in the anus or mouth and the variations in temperature watched and recorded every two hours. If a rise in temperature takes place to the extent mentioned, it is held to be proof that the animal is diseased.

*By an hon. Member :*

Q. Within what length of time does this change take place?

A. Usually in eight or ten hours. In Bulletin No. 20 of the Experimental Farm series, a very full account is given of all the tests conducted at the Central Farm. These show that the conditions vary in different animals. Usually the temperature rises within eight or ten hours and remains up for six or eight hours.

*By Mr. McMillan :*

Q. You will have to take the normal temperature before making the tests?

A. Certainly; the natural temperature is usually taken before the test is made for three times at intervals of two or three hours each, and the average of these is used as a basis for comparison.

*By Mr. Cargill :*

Q. Do you consider this a reliable test under all cases?

A. I do, sir. As I have already stated, we have killed many animals at the experimental farms here which have reacted, and have found the disease in every case ex-



cept that one which I have referred to, and we might, in all probability, have found it in that if we had searched more thoroughly.

Q. I have been told by parties who import cattle that in testing them one or two will probably react and then on a subsequent test these one or two which reacted would stand the subsequent test without reacting, and probably one or two others which stood the former test will react.

A. It is a well known fact that where repeated tests are made with tuberculin if you do not allow the lapse of sufficient time, you do not get the reaction again, as a rule. That has been shown in the bulletin I have referred to. We tested animals a second time after two weeks, and these, although badly diseased, did not show any reaction from the second injection.

*By Mr. Cochrane :*

Q. I understand that Mr. Cargill says that with some animals in the same herd a couple of them would react, and then after a while he tested those that had not been tested, and they would show reaction.

*By Mr. Cargill :*

Q. No, no ; the same lot.

A. At what lapse of time, sir ?

Q. It wouldn't be more than a week or ten days.

A. I have never known of any instance of that kind.

*By Mr. McMillan :*

Q. Is there any case, in your knowledge, of a healthy animal, after having been tested three or four times with tuberculin, suffering from the disease ?

A. I have never known any instance of the health of the animal suffering. We had cases of an animal one year giving no reaction and the following year showing signs of the disease. The two animals I referred to as affected at Indian Head, were tested two years ago and showed no reaction, but this year they reacted, and on killing them the disease was detected. These, probably, had the germs of the disease in them at the time first tested, but not far enough advanced to bring about the reaction under the tuberculin test.

*By Mr. Ratz :*

Q. What do you do with the animals which are diseased ?

A. We bury them.

#### EXPERIMENTAL FARM, NAPPAN, NOVA SCOTIA.

At this as well as at all the other branch farms experiments have been carried on during the past year with grain, fodder crops and roots similar to those I have spoken of at the Central Farm.

Last season the crops at Nappan were lighter than usual with all sorts of grain. Rust prevailed to a large extent and at the Experimental Farm we suffered from this disease as elsewhere, and the crops were reduced. The average crop for all the varieties of oats grown was thirty-seven bushels per acre, the average of the best twelve sorts was forty-six bushels thirty-one pounds, and the largest crop was fifty bushels per acre. In barley the average of all the two-rowed varieties was twenty-nine bushels twenty-three pounds, the average of the best twelve sorts, thirty-four bushels twenty-eight pounds ; and the largest crop was forty bushels and forty pounds per acre. The six-rowed barley gave an average from all varieties of thirty-six bushels twenty-one pounds, the average of the best twelve sorts was forty-four bushels fifteen pounds, and the largest crop was fifty bushels per acre. In spring wheat the average of all varieties was eighteen bushels forty pounds, the average of

the best twelve sorts, twenty-two bushels twenty-three pounds, while the largest crop was twenty-five bushels twenty pounds per acre. I give you these figures to show that the falling off has been quite considerable as compared with former years, and this has been due largely to the prevalence of rust. Indian corn did well at the Nappan Farm; the average of all the varieties was fifteen tons 1,695 pounds per acre, the average of the best six sorts nineteen tons 1,967 pounds, and the largest crop was twenty-three tons 1,850 pounds per acre. Turnips have done fairly well—roots generally succeed well in the maritime provinces—the average of all the varieties of turnips grown was twenty-six tons 551 pounds, the average of the best six sorts thirty tons 625 pounds, and the largest crop thirty tons 1,915 pounds per acre. In mangels the average of all varieties was twenty-three tons 841 pounds, the average of the best six sorts thirty tons 1,627 pounds, and the largest crop thirty-eight tons 125 pounds per acre. Carrots gave an average yield on all varieties of twelve tons 768 pounds, the average of the best six varieties was fifteen tons 1,320 pounds, and the largest crop was seventeen tons, seventy-five pounds per acre.

*By Mr. Broder :*

Q. With turnips do you test different times of sowing, earlier and later ?

A. Yes, sir, we had at all the experimental farms two series of plots, one sown two weeks later than the other. At the Central Experimental Farm we carry that point further and sowed last year four series of plots at intervals of from eight to twenty days each, but at the branch farms there are but two sowings.

*By Mr. Macdonald (Kings) :*

Q. Have you got the names of the kinds of wheat that gave the results mentioned

A. Yes. Wellman's Fife gave the largest crop of wheat at the Nappan farm, and the varieties that stood next were Pringle's Champlain, Beauty, Progress, Alpha and Admiral, Hungarian, White Connell, Emporium and Huron. These are the varieties which averaged twenty-two bushels, twenty-three pounds per acre, the Wellman's Fife having given the largest yield, namely, twenty-five bushels and twenty pounds per acre.

*By Mr. Semple :*

Q. What was the result of the early and late sowing of turnips ?

A. The average of the crop of the first sowing at Nappan was 28 tons 1,185 pounds per acre while the second sowing gave an average of 23 tons 1,918 pounds per acre, a difference of 4 tons 1,267 pounds per acre in favour of early sowing. The quality of the turnips has generally been a little more woody from the first sowing than the second, but I do not think that is a matter of much moment, as the cattle seem to eat them just as freely as those later sown.

*By Mr. Burnett :*

Q. What was the time of the first sowing ?

A. The first turnips were sown at Nappan on the 25th of May; the second on the 7th June. The first sowing at the Central Farm last year was on the 28th of April, the second on the 6th of May, the third on the 21st of May, the fourth on the 11th of June. The average yield per acre from the first sowing was 25 tons 1,298 pounds, that was perhaps unduly early as it did not yield as well as the second sowing. The next sowing, that on 6th May, gave 26 tons 905 pounds. The average yield from the third sowing was 33 tons 330 pounds, and that from the last sowing was 24 tons 1,413 pounds.

*By Mr. Broder :*

Q. The last sowing was in June ?

A. Early in June. The differences were not so largely in favour of the early sowings last year as they usually are, much depends on the season.

*By Mr. Bell (Pictou):*

Q. Which gave the biggest yield?

A. In this case the second sowing gave the largest crop, that of the 6th of May.

Q. How many tons was that?

A. Taking the average of all the varieties the yield was 26 tons 905 pounds per acre. The largest crop was given by the East Lothian, which was 30 tons 710 pounds per acre.

*By Mr. Broder:*

Q. The Kangaroo turnip has been recommended by some. Can you tell us anything about that?

A. No. That is a variety which has not been tried here. In fact, I have not heard of this sort before.

Q. They are raising it in the Eastern provinces?

A. There are many instances occurring of local seedsmen giving extraordinary names to old varieties. Possibly this may be a case of that sort, as I have not met with this name in any of the seed catalogues.

Q. It is a very long turnip, not unlike a Sweedish turnip. The people there have been calling it a Government turnip, that is what made me ask the question?

A. It did not come from the Experimental Farm under that name.

Potatoes have given very good results at Nappan during the past year. The average of the best twelve varieties was 378 bushels and 28 pounds, and the largest crop, 448 bushels 48 pounds per acre.

Horse beans have been tested during the past season at all the Experimental Farms by growing them in rows of different widths, and they have succeeded very well at Nappan, the largest crop there being 13 tons 400 lbs. per acre. Horse beans have done poorly on all the other farms. In all cases these experiments have shown that growing them in rows two instead of three feet apart has produced the best results. On inquiry I find that it is a common practice in Great Britain to grow horse beans in rows two feet apart.

Soja beans have given the largest crops at Nappan in drills two feet apart, namely 5 tons 600 lbs. per acre. The Soja beans have not done as well at Nappan as the horse beans, whereas at the other farms they have done a great deal better. In these experiments the best results have been had when the seed has been sown in drills from 21 to 24 inches apart.

In millets there is a new variety, the Japanese millet, coming to the front, which promises to be very valuable as a fodder plant. It gave a yield last year at Nappan of 16 tons 1,960 lbs. per acre when grown at a distance of 15 inches between the rows.

#### WATER SUPPLY.

For some years past the water supply at the Nappan farm has been very defective. Last year some springs were found on the farm in the woods on high ground, about three-quarters of a mile from the buildings. A reservoir was constructed near the source of the springs and the water has been brought from this in galvanized iron pipes and introduced into all the buildings. This water has been analysed by the chemist of the Experimental Farms who says: "It is exceedingly good water, exceptionally pure, and one eminently suited to drinking and household purposes." The supply is ample for drinking and household purposes and is of excellent quality.

#### EXPERIMENTS WITH MILCH COWS.

During the last year a comprehensive test has been conducted with the whole herd of milch cows, 27 in all, showing the cost of feed and receipt from sales of milk, setting the manure against the labour. The results show an average profit of \$14 per cow. The different animals vary very much; the best one gave a profit of \$28.64; the



poorest one 21 cents, showing that it is very important for farmers to know what sort of animals they are feeding and to watch the results they get so that they may find out whether each cow is giving a profit or whether they are keeping some animals for the pleasure of their company.

A comparison was made by Mr. Robertson of two groups of cows about equal in quality, which showed that more profit was made from cows which calved in the fall than from those which calved in the spring.

*By Mr. Wilson :*

Q. Does he give any reason why ?

A. No ; but he shows that they gave more milk and consumed more of the rough products of the farm.

*By Mr. Calvert :*

Q. What did he do with the milk ?

A. He sold it to the experimental dairy at Nappan, which is conducted by the Dairy Commissioner. The milk was delivered there and sold for the making of butter.

*By Mr. McMillan :*

Q. That was a very low average of profit, \$14 ?

A. That was the average. If the poorer cows had been eliminated, the results would have been better. I may say that it is not the most successful experiments that give us always the most useful information. If we take the average results and can explain the conditions under which they are obtained and point out how these may be improved, these are sometimes more valuable and impressive than if we could show a large gain from each animal.

*By Mr. Macdonald :*

Q. Does the profit from cows calving in the fall arise from the advanced price of the butter or the better quality of the milk ?

A. In his report the superintendent says : " One striking fact is that cows of equal quality (as near as can be judged) which were fresh in the fall gave more profit than their equals fresh in the spring, besides consuming more of the rough products of the farm. For instance, Nos. 21, 24 and 26 were fresh in the spring, and consumed \$117.62 worth of feed, paid for it and left a balance of \$63.13 to their credit. While Nos. 6, 17, 22 and 25 that were fresh in the fall consumed \$154.51, paid for it and left a balance of \$106.11, being \$10.75 per cow in favour of the fall-calved cow."

*By Mr. McLaren :*

Q. Would that not be on account of getting better profits in the winter ?

A. That might influence the result to some extent, but I could not say how much. We get an advance on the milk sent to the dairy of 50 cents per hundred pounds, which is paid at the end of each month for all the milk delivered, then at the end of the year, after the cost of the butter has been deducted the balance of profit is divided pro rata among the patrons who have supplied the milk.

*By Mr. Calvert :*

Q. You don't remember what the average would be ?

A. I do not, and the particulars are not given to us in such a way as would enable us to get that information.

*By Mr. McMillan :*

Q. The cows are pastured in summer ?

A. Yes.

Q. Cows fully fed lying in the stable in the winter will give more milk than cows in pasture ?

*By Mr. Cargill :*

Q. Although the winter feeding costs more money the product in milk will be so much greater that the difference will be in favour of the winter-fed cow ?

A. There is a difference of \$10.75 per cow in favour of those which calved in the fall after taking the cost of the feeding in each case.

Q. The difference in profit is in favour of the winter cow ?

*By Mr. Martin :*

Q. Is the milk in both cases used for the manufacture of butter ?

A. I believe so—I do not think there has been any cheese made at this factory during the past two or three years.

Q. Is the milk sold absolutely, or is the skimmed milk returned to the farm ?

A. The skim milk is returned to the farm.

Q. In making up the profits do you take into account the feeding of calves ?

A. Yes. The value of the skim milk is duly estimated.

An additional area of land has been cleared on this farm during the year and some of it brought into cultivation. Improvements have also been made in the buildings.

In the horticultural branch many additional varieties of large and small fruits have been planted and the orchards have made satisfactory growth, that which is sheltered by a belt of wood has done exceptionally well. Comparative tests have also been made of many varieties of small fruits, also with many different sorts of garden vegetables, such as pease, tomatoes and corn.

The superintendent of the farm and the horticulturist have devoted a good deal of time during the past year to attending meetings of farmers and delivering addresses in different parts of the maritime provinces on agricultural and horticultural subjects.

Satisfactory progress has been made in all branches of the work, and quite a number of varieties have been added to the collection of ornamental trees, shrubs and plants now being tested at Nappan as to their hardiness and general usefulness for the maritime provinces.

#### THE BRANCH EXPERIMENTAL FARM AT BRANDON.

At the Brandon farm experiments of a similar nature to those I have described in connection with Nappan have been conducted, but with better results in some respects, particularly in reference to the oat crop. The Brandon farm this year takes the lead of all the Experimental Farms in the number of bushels per acre obtained of this cereal. The average crop of all the varieties tested was ninety bushels and eight pounds per acre. The best twelve sorts gave an average of 107 bushels and 13 pounds, while the heaviest yielding variety, a newly introduced oat, the White Giant, gave a yield of 114 bushels 4 pounds to the acre.

Barley has also done remarkably well there, the two-rowed varieties of the best six sorts, gave an average of fifty-nine bushels and twenty-eight pounds per acre, the average of all varieties was fifty-one bushels and thirty-five pounds, and the largest yielder, the Kirby, a newly introduced hybrid sort gave sixty-five bushels and twenty pounds per acre.

The six-rowed barleys which were tested have also done well. The average yield of all the varieties has been fifty five bushels and seventeen pounds, the best six sorts have averaged sixty-three bushels and forty-six pounds per acre and the largest crop

has been given by the Stella, which is also one of the new hybrids, and gave sixty-eight bushels and sixteen pounds per acre.

The yields of spring wheat at the Brandon farm have not come quite up to those of the Experimental Farm at Indian Head this year, but they show well with an average crop of all varieties of thirty bushels to the acre, while the general average for the province of Manitoba has been about eighteen bushels. These larger crops show the advantages we have derived from a thorough preparation of the land, early sowing, using only plump and well matured grain for seed and selecting the most productive and vigorous varieties for sowing.

*By an hon. Member :*

Q. How many bushels to the acre have you sown?

A. In sowing spring wheat we use a bushel and a-half to the acre, of barley we usually sow two bushels to the acre, and oats will vary from a bushel and three pecks to two bushels; where short plump oats are used a bushel and three pecks is sufficient.

*By Mr. Calvert :*

Q. Would the average figures you have given be taken from the small plots or from the larger field plots?

A. The averages I have quoted are the results which have been obtained from the small plots; I have, however, some figures regarding the field crops which I shall be glad to give you. They show that the field crops compare very well with those obtained from the smaller plots.

Q. You gave spring wheat at thirty bushels to the acre and the general average of the province at eighteen bushels, would that thirty bushels be from the small plots?

A. That would be from small plots. You will find, however, by referring to the field crops, that the returns have been much the same. I will give you the figures of some of the field crops at Brandon.

I may say that the area occupied by field crops at Brandon is not large with any one variety as we have so many different sorts to grow.

VARIETY.	SIZE OF FIELD.	YIELD PER ACRE.	
	ACRES	BUSHEL.	POUNDS.
Wellman's Fife.....	1 $\frac{1}{4}$	40	..
Red Fife.....	2	39	30
Preston.....	3	36	..
Percy.....	2	31	30
Red Fife.....	3 $\frac{1}{2}$	30	40
White Connell.....	3 $\frac{1}{4}$	30	8
Crown.....	1	38	18
White Russian.....	1	37	43
Dufferin.....	1	34	28
Vernon.....	1	33	30

In the whole list of field crops of wheat comprising over thirty acres, the average yield has been about thirty-two bushels per acre, which is a larger average than that obtained from the smaller plots.

*By an hon. Member :*

Q. Is the seed sown in drills or broadcast?

A. Always in drills at the experimental farms. We have tried broadcast sowing for several years at Brandon, and the results have shown that it is much more economical to sow with the drills.



The practice is to use more seed when sowing broadcast than in the drills, and the crop has not been so good.

*By Mr. McNeill :*

Q. In speaking of these varieties you have just referred to, have you found in many years much difference in varieties?

A. Yes, sir, we have found in a four years' test that some varieties will average much more than others. And these demonstrations in bushels per acre, cannot be set aside. Where we sow for four or five years running a number of varieties and find certain sorts coming to the top of the list every year with a large average yield, that, to my mind, is quite sufficient to justify the recommending of these varieties for general cultivation, and when tried they usually give very satisfactory results.

In Manitoba the pea crop is attracting more attention than formerly. The varieties tested have nearly all done well, and have averaged 41 bushels 8 pounds per acre, the best twelve sorts giving 51 bushels 7 pounds per acre. The highest yielder was Harrison's Glory, which gave 59 bushels per acre. This is a variety which was introduced some years ago at the Agricultural College at Guelph, Ont. It came, I think, from England, and has done unusually well at Brandon. Indian corn has also given good crops, the best six sorts having given an average yield of 23 tons 1,450 pounds per acre. The yield of roots have been remarkable during the past year—the best six varieties of turnips averaging 49 tons 1,088 pounds per acre, and the best six varieties of mangels averaging 62 tons 872 pounds per acre.

Q. In the experimental plots?

A. Yes, sir, but the experimental plots are sown in precisely the same way as the field plots, in rows  $2\frac{1}{2}$  feet apart, and the yields per acre are calculated from the weight of roots obtained from two rows, each 66 feet long.

Q. Do you find the experimental plots and the field cultivation yield about the same on an average?

A. Much the same where the land is of fair average quality.

Carrots have given much lighter yields, the average from the best six varieties was 12 tons 567 pounds. The crop of potatoes has been unusually large, the average returns from the whole number of varieties tested, which was 104 in all, were 394 bushels 18 pounds per acre. The best twelve sorts have averaged 600 bushels 7 pounds per acre. The largest yielder was a seedling which was originated at the Central Farm, this gave 682 bushels 8 pounds per acre.

#### TREATMENT OF OATS FOR SMUT.

Experiments have also been continued with reference to smut in grain and especially with the smut which affects oats. This variety of smut has been increasing very much in Manitoba of late years, so much so, that in some localities it has reduced the weight of the crop considerably. We have been trying experiments with a new antiseptic, formalin or formaldehyde. This is a liquid known in commerce under both these names, and in both instances it consists of a 40 per cent solution of formaldehyde in water. It is a very strong antiseptic, and we find that by taking  $4\frac{1}{2}$  ounces of formalin, which costs about 5 cents an ounce, and mixing it with 10 gallons of water and steeping the grain in that mixture we get a complete remedy for this trouble. We have tried soaking the grain for two hours and for one hour, and we have tried it at Brandon for ten minutes and have found the result satisfactory in all cases. The grain grown on plots where the seed was so treated was completely free from smut. We are carrying on the same line of experiments this year, as this is one of the most hopeful things for smut in oats and barley we have ever tested. Smut in wheat we can control well with blue stone, that has now been tried for many years and found to be an effectual remedy.

*By Mr. Bell (Pictou):*

Q. What was the shortest time of soaking you found effectual?

A. The shortest time tried was 10 minutes. In the past most of the remedies used for smut in oats have involved soaking for twenty-four hours, but we began with the formalin by soaking for two hours. Then at Brandon it was tried by Mr. Bedford for a shorter time, half-an-hour and subsequently for fifteen and ten minutes, and he found good results from it all through. This year it is being tested on all the experimental farms for the shorter periods.

*By Mr. McMillan:*

Q. What did you say was the price of the formalin?

A. We have paid here, buying it at wholesale, 50 cents a pound, that is less than 4 cents an ounce. I said 5 cents an ounce. I have seen it advertised in the North-west papers at 75 cents a pound, that is a little less than 5 cents per ounce.

*By Mr. Bell (Pictou):*

Q. Will it be necessary to saturate the grain or will it do to sprinkle the solution?

A. I am not yet able to answer that question. One of the experiments being tried this year is to sprinkle the grain and see if that will have the desired effect.

*By an honourable Member:*

Q. I suppose you soak one lot of grain and put an another in the same fluid after it?

A. Yes, as long as the liquid lasts.

*By Mr. Bell (Pictou):*

Q. Is this remedy for sale all over Canada?

A. I think you will have no difficulty in procuring it from drug stores in any town or city. The superintendents of our North-west farms have both spoken of the usefulness of this remedy at meetings in the North-west where this is a matter of more vital importance than it is here, and they inform me that it can be procured now almost everywhere in that part of the country, and I understand it has been used by many farmers for this purpose during the past season.

*By Mr. McMillan:*

Q. It dissolves entirely like water?

A. It mixes readily with water in all proportions.

*By an honourable Member:*

Q. After you have soaked the oats in this solution do you dry them then?

A. We spread them out for an hour or so before sowing.

*By Mr. Moore:*

Q. Were wheat, barley and oats all treated in this way?

A. We tried oats only last year, but this year barley is also being tried. The covering of these cereals, being wrinkled and uneven, it has been difficult to find a satisfactory remedy. It does well with the oats, and I think will do well with barley. The ordinary remedy, bluestone dissolved in water, has been found quite effective with smut in wheat.

*By the Chairman :*

Q. This formalin is the same article that is used for domestic purposes for destroying mold ?

A. Yes, it is an antiseptic, and is used also in hospitals as a germ destroyer.

*By Mr. McLaren :*

Q. The cheese, supply men all over the country keep this in stock in large quantities ?

Q. In the factories ?

A. Those who furnish dairy supplies in the different towns in Canada.

*By Mr. Bell (Pictou) :*

Q. What strength of bluestone do you use ?

A. One pound in a pail and a half of water and that is sprinkled on ten bushels of wheat. That quantity of the solution is enough to moisten every kernel of the ten bushels of wheat when stirred well with a shovel.

*By Mr. McNeill :*

Q. How much of the formalin would be required to do say ten bushels ?

A. I could not say just what quantity of the fluid would be required for ten bushels of grain—We recommend  $4\frac{1}{2}$  oz. of the formalin to be mixed with ten imperial gallons of water. About twenty cents would cover the cost of this quantity.

Q. How much grain would that suffice for ?

A. We have not yet determined that point, our plan has been to immerse the grain in very coarse open sacking in the liquid and leave it there for ten or fifteen minutes, then lift it out, allow the liquid to drain and empty the grain out to dry. I do not know how many small sacks could be soaked in this way in ten imperial gallons. That would be about a quarter of a barrel. The mixture would cost about eighty cents a barrel.

*By Mr. McMillan :*

Q. You have never tried just dipping it and taking it out when it is merely wet ?

A. No, sir, we should prefer leaving it in for ten minutes. It is well to give it time enough so that every part of the grain may be well wetted.

Q. If dipping would do, it could be done so much quicker ?

A. We are trying this year not only soaking for short periods, but also the effect of sprinkling.

#### FLAX, SOJA BEANS, JAPANESE MILLET, &C.

Experiments have also been conducted at Brandon with flax, Soja beans, Japanese millet and a number of different varieties of grains and clovers, from which much useful information has been obtained. Experiments have also been carried on to show the usefulness of straw as a fodder for steers. The results of these tests have shown that the animals do very well with straw if the farmer has not hay, provided he uses with it turnips and ground barley.

*By an honourable Member :*

Q. Would you cut the straw ?

A. Yes, by all means.



## FATTENING OF CHICKENS.

Experiments have been conducted at Brandon for the past two years in the fattening of chickens and turkeys and much useful information has been gained. These experiments have been tried by penning one group of birds and allowing the other to run at large. The groups were equal in number and in 1897 five penned turkeys gained in 24 days 11 lbs. more than the five running at large, and three Plymouth Rock cockerels also gained 3 lbs. 3 ozs. more in confinement. These experiments have been carried on without cramming the birds. They were fed all they would eat. We find that from three to four weeks is as long as it is profitable to fatten birds in confinement, and that after that time it takes a great deal more food for every pound of flesh added. Experiments this last year, 1898, with four Plymouth Rock chickens in each case showed that they gained 5.06 lbs. more in four weeks when penned than the same number of birds allowed to run at large.

*By Mr. Calvert :*

Q. What did the cost of feeding the birds come to per pound of gain ?

A. Mr. Bedford estimates it at 3 cents a pound, which I notice is a good deal less than the Dairy Commissioner reports as the cost of feeding here.

Q. I think it is 6 or 6½ cents per lb., and Mr. Bedford gives us 3 cents per lb. I don't know whether the climate has anything to do with it or would make that difference.

A. I cannot say as to that.

*By Mr. McNeill :*

Q. Is it fed whole or ground ?

A. The grain was crushed and moistened, he says, for the morning meal and fed whole for the evening meal.

Q. What was it moistened with ?

A. With water.

Q. Not with milk.

A. No, not with milk.

Mr. Bedford says that the feed consumed was 7½ lbs. wheat, 3¾ lbs. oats and 3¾ lbs. barley for the 5.06 pounds of gain, and he valued the grain at one cent per pound which made 15 cents in all ; so the cost of feed per pound of gain was about 3 cents.

Some interesting experiments in fattening chickens were carried on also at the Central Farm last year which will be given you by Mr. Gilbert, the poultry manager, in his evidence. These experiments seem to show that poultry can be made to increase in weight very rapidly when penned and given all they can eat without the use of the cramming machine, provided the best breeds are selected for this purpose.

## FRUIT AND FOREST TREES.

Further experiments have also been made at Brandon with large and small fruits. It is gratifying to know that the cross bred varieties of apples, crosses between the Siberian crab and the larger and hardier apples of the east have wintered well, most of them having budded from the tips. I have had word from Mr. McKay during the last few days that the wild types of these fruits have wintered well, but that some of the cross-bred sorts have been killed. We have thirty-six of these varieties fruiting this season here, some of them had an unusual show of large blossoms, and the fruit of the crosses between this small crab and the Wealthy apple is now about three times the size of the average of the crabs on the tree from which these crosses were produced. These are photographs of the blossoms, showing the flowers of the two parents and those of the

progeny. The photograph shows the flowers of this cross of nearly double the size of those produced on the parent trees. Mr. Shutt kindly made these photographs for me.

*By Mr McNeill :*

Q. The male used in this cross was the Wealthy?

A. Yes, we have used the Wild Siberian crab for the female, for the reason that we have found in other experiments that it is usually the female which gives constitution and hardiness to the progeny. I think that the outlook is very hopeful for getting some varieties of fruits from this source which will be really valuable for the North-west country. We shall be able to judge better as to this after we have seen the fruits which are now growing, mature. They are growing rapidly and look very promising.

Many experiments have been made on the Brandon farm with forest and ornamental trees, also with ornamental shrubs and flowers. The people in that part of the Dominion, especially, regard with the greatest pleasure and delight the accession of additional fruits, blooming plants and ornamental shrubs, and this department of the work of this branch farm is, I think, one of the most useful lines which can be followed. It makes the settlers more contented with their homes when they find that they can grow so many beautiful things about them, and thus make their surroundings attractive. These little things all count in the lives of the people, and I think that the more contented the settlers are the better it will be for the country. Much experience is being gained each year as to the hardiness of the different varieties of forest and ornamental trees, shrubs and flowers, and the number of species and varieties found useful in this part of the Dominion is steadily increasing. Many comprehensive experiments have also been carried on at the experimental farm at Brandon by Mr. Bedford, in the testing of vegetables to determine those most suitable to the climate of Manitoba.

#### BRANCH EXPERIMENTAL FARM AT INDIAN HEAD.

At Indian Head the oat crop in the test plots has averaged less than in Brandon, the whole of the varieties tested having given an average of 61 bush. 30 lbs. to the acre and the best 12 varieties an average of 74 bush. 15 lbs. In field crops they have done better. Buckbee's Illinois has headed the list of the uniform test plots with a crop of 79 bush. 14 lbs. per acre, but in the field crops 15 acres of Banner have given an average of 85 bushels, while 10 acres of Abundance gave an average of 82 bushels to the acre.

*By Mr. Moore :*

Q. You reckon 34 pounds to the bushel, I presume?

A. Yes ; 34 pounds to the bushel.

Of the two-rowed barleys the crop has been good ; the six best sorts gave an average crop of 54 bush. 16 lbs. and the largest crop which was given by the Danish Chevalier was 57 bush. 44 lbs. per acre. The average of all the varieties of two-rowed barley was 45 bush. 37 lbs.

The six-rowed barleys have also averaged very well and have been a little more productive than the two-rowed sorts, the best six varieties having given an average of 53 bushels and 6 lbs, per acre, the largest crop being 56 bushels 32 lbs.

In spring wheat the Indian Head farm has given the largest crops obtained from any of the farms, the average of all the varieties tried having been 36 bushels 10 lbs. per acre, an average of 6 bushels 10 lbs. higher than that at the Brandon farm, which stands next in the list. The best twelve sorts of spring wheat at the Indian Head farm

during the past year gave an average of 43 bushels per acre, and these varieties have run very even in crop and range as follows:—

	Bush.	Lbs.
No. 1 White Fife.....	45	30
No. 2 Percy.....	45	20
No. 3 Red Fife.....	44	20
No. 4 Monarch.....	43	20
No. 5 Stanley.....	43	10
No. 6 Wellman's Fife.....	43	10
No. 7 Captor.....	42	30
No. 8 White Connell.....	42	30
No. 9 White Russian.....	42	20
No. 10 Preston.....	42	10
No. 11 Crown.....	41	20
No. 12 Progress.....	40	20

Looking over the list it will be seen that the first ten come within very close range of each other; the greatest difference is 3 bush., the one at the top producing 45 and the tenth 42, showing that the averages of the productive sorts have been uniformly high at that farm.

*By Mr. McNeill:*

Q. How many of these are cross-bred sorts?

A. Four out of the ten are cross-breds, and one, the Percy, stands within 10 lbs. per acre of the highest yielder, which was the White Fife.

Q. How about the ripening of these hybrids?

A. They ripen about four days earlier on the average than the White or Red Fife, taking a series of years. In some seasons the difference is greater and in other seasons less, but that is about the average. This earlier ripening habit has been inherited from the early variety used as one of the parents in this cross. The Red Fife and White Fife wheats have been used as one of the parents in these crosses.

Q. You mean that they are so many days earlier than the Red Fife?

A. Yes.

Nine varieties of fall wheat were tested last year at Indian Head inside one of the hedge inclosures. They wintered well and made very strong growth, but rust struck them early and badly and they gave a very poor yield, the crops averaging from nine to fifteen bushels per acre.

*By Mr. McMillan:*

Q. What sort of a hedge was used about this enclosure?

A. It was a willow hedge.

Q. I know farmers who had rust and barberry hedges and when the hedges were destroyed they had no rust after that.

A. That is no doubt so, on the other hand we have had barberry hedges at the Central Farm and I have never been able to detect any difference in the rusting between the wheat grown near the hedges and that growing distant from them. There are so many conditions which influence crops that it is not always safe to draw positive conclusions from such results. I have mentioned this fall wheat experiment because we have tried to grow it many times and have failed. When it does ripen at Indian Head it usually matures later than spring wheat and gives a lighter crop.

Pease have shown up well at the Indian Head farm, the average of the 47 varieties tested was thirty-seven bushels fifty-nine pounds. The best twelve sorts gave an average of forty-seven bushels twenty-seven pounds, while the largest yielder, the Paragon, gave fifty-seven bushels and fifty pounds. Indian corn has also done fairly well at Indian Head but the crops were very late. The average of all varieties was



eleven tons 1,399 pounds, and the best six sorts gave an average of 15 tons 1271 pounds. The crops of turnips, of which very few are grown in that section of country, were very fair, the best six varieties tested giving an average of 26 tons 1,658 pounds per acre. The six best varieties of mangels gave an average of 28 tons 1,853 pounds. This is an unusually large crop for Indian Head, the season being short there root crops are usually small. Carrots have always given a small yield there, and last year they fell much short of turnips and mangels.

In the potato crop Indian Head stands this year above all the other experimental farms. The 104 varieties which were tested have given the unprecedented average of 503 bushels 16 lbs per acre. The 12 best varieties averages 652 bushels per acre, and the largest cropper the Polaris, stands at the head with 706 bushels and 12 pounds per acre. Mr. McKay tells me they have never seen such a crop of potatoes in the North-west Territories as that of last year.

The experiments in grasses, which are so important, have been continued and attract much interest, but owing to the very dry spring the crops of hay were light, there being no rain till June. Fields from which only one crop of Brome grass had been taken averaged 1,700 pounds per acre, while a newly sown field last year, notwithstanding the dry weather, gave 2 tons 500 pounds per acre. Experiments were begun in the spring of 1898, both at Brandon and Indian Head, with the view of gaining information as to the best plants to sow for ploughing under to enrich the soil. We have found that looking to the maintenance of the fertility of the land, attempts to grow clover with grain as a nurse crop have always been a failure. We find that the grain takes all the moisture out of the land and that there is not enough moisture left in the soil after harvest to give the young plants a fair start, and we have never had any results worth ploughing under from such experiments. But by sowing clover on fallow land without a nurse crop we have had a good growth, and we hope that instead of having a bare fallow every third year, to sow clover, for ploughing down and in this way add to the fertility of the soil and thus help future crops of grain. On the plots devoted to this test last year we had different varieties of clover; we also sowed buckwheat and rape and ploughed these under, for the reason that some farmers advocate the growth of these plants for that purpose. These plots were all ploughed under when in the best condition in the autumn, and sown with Red Fife wheat in the spring. The yields of the different plots will be ascertained when the harvest comes on, and we shall then be able to see the results of this work.

The tests undertaken this year have been in reference to a more permanent rotation of crops. We have laid out a series of half-acre plots, leaving some for check plots, and these were sown with mammoth red clover, common red clover, Alsike clover, pease, tares, lucerne, buckwheat, rape and Brome grass, and these 20 half-acre plots have been arranged for a three years' test. The first series of these plots have been sown with clover which will be followed next year with wheat, and then some of them in the third year with wheat and others with oats, following the practice of some of the farmers in the district in regard to this rotation. The next series of plots are occupied this year with grain, and will have clover next year, and the following year will be sown with grain. The third series will be in grain for the next two years, then following with clovers. It is proposed to carry on this work for a number of years—the plots being so arranged as to show every year both the leguminous crops and the grain crops. I hope that in a few years we shall thus gain much light on that subject, which is so important in the North-west, and be able to demonstrate that the fertility of the land may thus be maintained for a long period.

*By Mr. McNeill :*

Q. Is the land liable to become clover sick?

A. We really know very little about clover sickness in this country, unless it be true that there are lands of that character in Prince Edward Island. That is the only part of the country where I have heard any complaint of this peculiar condition. In several instances where farmers have complained of failure in growing clover in Prince Edward Island I have found that the quantity of seed sown was very small, about four

pounds to the acre. In such case if the seed chanced to be of poor quality, not much success could be expected. Possibly this may be the true explanation of some of the failures reported.

Experiments have also been carried on at Indian Head with horse beans, Soja beans, Japanese millet, rape, flax, tares, and canary grass, and much useful information has been gathered regarding these crops. A large list of vegetables have also been tried to gain further information as to the sorts which are best suited to the climate of the North-west.

#### FOREST TREES, FRUITS, ETC., AT INDIAN HEAD.

Experiments with forest trees have been continued, especially in the direction of discovering the most economical methods of raising trees from seed such as are suitable for that country and of planting and caring for them. Many new varieties have also been introduced there for test. The question was then asked "What does it cost to plant and keep up an acre of these trees?" The total cost per acre for four years under different methods of planting and care has varied from \$12 to \$15 per acre. This includes the cost of planting and keeping the ground clean for the whole of this period, by which time the trees will be large enough to shade the ground and hence require no further care. That does not, however, include the cost of growing the young trees for planting.

*By Mr. Calvert :*

Q. About how many did you plant to the acre?

A. We have been gaining information every year on this subject and have tried them at different distances, but we find that five feet apart each way gives the best results as far as our experience has gone. The great point is to get as early as possible enough foliage to shade the ground and thus prevent the growth of weeds, then the farmer has no trouble with his tree plantation. Our latest experiment has been to plant forest trees and sand cherries in alternate rows about  $2\frac{1}{2}$  feet apart. The sand cherries make very quick growth and spread rapidly over the ground and it is expected that in two years enough shade will be had from the sand cherries so that there will be no further need for cultivation. The sand cherries would probably die out when the other trees grow large enough to shade the ground thoroughly. In this particular plantation the trees have been arranged so as to permit of cutting out those of least value, leaving permanently those of the most valuable sorts. In this case the ash and the elm are intended eventually to occupy the ground entirely, they will probably be large enough to serve this purpose in ten years.

More than 300 varieties of forest and ornamental trees and shrubs have now been tested at Indian Head during the past ten years, and much information gained as to their relative hardiness. Sufficient experience has now been gained to justify the publication of a list of the most hardy and useful species, which will probably be issued before the close of the present year. Many sorts of small fruits have been successfully grown; currants, gooseberries and raspberries have done well. Strawberries have not done so well, because the spring frosts so often destroy the blossoms. With the large fruits we have as yet had no success. We have tested more than 200 of the hardiest varieties of apples from Russia and other parts of northern Europe and almost every year they have been killed down to the snow line. In the past ten or eleven years we have planted over 2,000 of these apple trees, and have not yet succeeded in getting an apple. We have now only the hardy cross-bred varieties to which I have referred, to look forward to, but these I think are very promising. A large proportion of the the cross-bred sorts and seedlings which were planted in 1897 at Indian Head lived during the following winter. I have not received full reports yet this year, but I know that the past winter has been unusually severe in the North-west; there has been a great deal of bare ground and very little snow on it during the severe weather. The Manitoba plum seedlings have all done well at Indian Head, but most of the seedlings of the improved varieties of native plums have not succeeded.

Experiments were conducted last year in the feeding of steers, comparing the relative merits of Brome hay, wheat chaff, threshed Brome hay and native hay for this purpose. Experiments have also been conducted with poultry and in the breeding of swine.

BRANCH EXPERIMENTAL FARM AT AGASSIZ, BRITISH COLUMBIA.

At the Agassiz farm the winter was mild, but the spring has been cold and backward. Similar tests to those carried on at the other farms as to the relative value of many varieties of grain have been carried on at that farm, and a large amount of useful information obtained, and the results of these tests have been inspected by a large number of visiting farmers. All the experimental farms are visited every year by a large number of farmers who inspect the work going on and thus gain much useful information which they can put into practice. At this farm the best 12 sorts of oats have given an average of 62 bushels 2 pounds per acre. The best 6 varieties of two-rowed barley have given 36 bushels 2 pounds per acre, and the best 6 varieties of six-rowed barley 37 bushels 21 pounds per acre.

*By Mr. McNeill :*

Q. What is the difference between the two-rowed and six-rowed barleys?

A. The difference at the experimental farm at Agassiz, British Columbia, is 3 bushels 19 pounds per acre on the average in favour of the six-rowed sorts.

The best twelve varieties of spring wheat gave 29 bushels 4 pounds per acre; pease have also done fairly well, the best twelve sorts having given an average crop of 36 bushels 7 pounds per acre.

These crops are not by any means phenomenal, and there are, no doubt, some farmers in British Columbia who have richer land and raise larger crops. The land on parts of the experimental farm at Agassiz is very variable. Much of it was formerly occupied by very large trees, and where these large Douglas firs have been removed, an excavation of about 20 to 30 feet in diameter or more has been made in each case to get out the stump. The underlying gravel has thus been turned on the top, and these gravelly patches are very poor in fertility and cannot be expected to produce heavy crops for some years.

*By Mr. McMillan :*

Q. How has the two-rowed and the six-rowed barley turned out this year?

A. On the whole, there was not very much difference; the average of all the varieties on all the farms of the two-rowed sorts was 42 bushels 29 pounds per acre, while the average of all the six-rowed sorts was 43 bushels 11 pounds per acre.

The season was very favourable at Agassiz for Indian corn, and the best six varieties, cut green-for ensilage, have given an average of 31 tons 298 pounds per acre.

*By an hon. Member :*

Q. That is the corn for fodder, you mean?

A. Yes; cut in the green state. The yield of roots has been much heavier than any we have ever had there before. The best six varieties of turnips have averaged 49 tons 262 pounds to the acre, and the best six mangels gave an average yield of 40 tons 572 pounds, while the best six varieties of field carrots gave an average of 36 tons 965 pounds per acre. The yield of carrots has been in advance of any crops of this root we have ever had before.

*By Mr. Moore :*

Q. Have you made any experiments with sugar beets?

A. Yes, but we have found that sugar beets do not usually yield as well as turnips or mangels. At Agassiz, the best yield given by any of the sugar beets was 35 tons



1,456 pounds, and the poorest 21 tons 1,912 pounds, not nearly as much as the turnips or mangels.

Q. That would be a higher yield than the farmers could expect, of course, in raising the sugar beet for the sugar factories?

A. Oh, yes. About 12 to 15 tons is the common yield for sugar beets in this country.

*By Mr. Calvert :*

Q. Does not that seem a very large yield, over 1,600 bushels to the acre?

A. Yes, it is a phenomenal yield. We have never before had any crops of roots to equal these. The returns, however, are made up with the greatest care and are thoroughly reliable.

*By Mr. Clancy :*

Q. You selected some of the largest specimens for the purpose of making the comparison, I presume?

A. Not by any means, we do no selecting of that sort. The returns are compiled from fair average rows all grown in the same manner, and the calculations are made from the weight of roots gathered from two rows, each 66 feet long. Experiments have also been made at Agassiz in remedies for smut in oats and formalin has been found very effective and seems to be an entire preventive of this disease. We used this in the proportion of  $4\frac{1}{2}$  ounces of formalin to 10 imperial gallons of water and the grain was soaked in this mixture for two hours.

*By Mr. McNeill :*

Q. You spoke of the large yield in carrots just now. What varieties did you refer to?

A. The varieties which gave the largest crops at Agassiz were the Improved Short White, and Half long White. We have several times had 27 and 28 tons to the acre from these varieties at Ottawa.

Q. There is a variety called the Altringham Red carrot?

A. Yes, but that, in our experience, is one of the poorest carrots we have grown.

Q. There seems to be some difference of opinion as to this variety?

A. Yes, but we have not found it a profitable sort, it is a long cylindrical root not easy to dig. The Improved Short White is a better carrot and stands well in the list at Agassiz, and is a good cropper.

Q. There is a great difference between the crops we have had of the Altringham carrot and the average you have referred to? Difference in the seed might partly account for this?

A. We obtain all our Improved Short White carrot seed from the one source, and send portions of the seed to each branch farm so that they all get exactly the same strain of seed for test.

Q. From the statement you have given it is evident that the different varieties of carrot vary very much, some averaging a yield much larger than others?

A. That is so, but at the same time you will find that some of the varieties which give the best returns at Agassiz do not give the largest crops at Ottawa, differences of climate affect the results very much.

Q. But you find that the White varieties you have referred to have yielded a better crop than the Altringham variety I have spoken of?

A. Yes; they will give on the average a much better crop than the Altringham.

*By Mr. Calvert :*

Q. The returns you have given us show an average of 1,200 bushels per acre?

A. Yes; but that was at Agassiz, B.C. We have never had as heavy crops as that at Ottawa.

Some further tests have been made at Agassiz in the growing of horse beans, Soja beans and Japanese millet. The Soja beans have given nearly double the crop of the horse beans, and the superintendent says that they make a splendid fodder, fine when fed green to cattle, and it was preferred both by horses and cattle to any other food.

*By Mr. McGregor :*

Q. Can you depend upon the growth of these beans in this climate?

A. We have tried them here for two years, and they have succeeded very well thus far.

Q. Have you tried them further west?

A. Yes ; we have tried them in Manitoba and at Indian Head, in the North-west Territories, with fairly good success.

*By Mr. McNeill :*

Q. What kind of a bean are they?

A. The early Soja bean is a small bean which is cultivated largely in Japan. The Japanese grow many varieties of these beans, and this is one of the earliest maturing sorts.

Q. Does it grow like other beans?

A. It is much more branching than the horse bean, and when full grown it stands about 3 feet 6 in. high, and sometimes as high as 4 feet. We have had the best crops where we have grown them in rows from 15 to 20 inches apart.

*By Mr. McGregor :*

Q. They will do well for the silo, will they?

A. I think they would do very well for ensilage, but we have not had enough of them growing at the experimental farms to enable us to test them thoroughly for this purpose, but we have tried feeding them to cattle, and the cattle eat them readily. They have been analysed by the chemist of the experimental farms, and they show quite as large a proportion of nitrogen as the horse bean, and will probably be a useful introduction for feeding purposes.

*By an hon. Member :*

Q. Do the beans ripen at all here?

A. Our season is not usually long enough to ripen them well at Ottawa. We cut them just about the time we cut the corn and the beans are then in a green state ; we did get some seed last year, about half a bushel, which we have sown and which has germinated very well, but they don't usually ripen at Ottawa. I have no doubt that they would ripen in western Ontario.

*By Mr. Clancy :*

Q. But for ensilage you have to cut them green anyway?

A. Yes, certainly. I think the difficulty with reference to obtaining seed will probably be removed shortly, and that seed will be grown in this country ; if not in Canada, in some of the warmer climates of the States, and that the seed will then be obtainable at a cheaper rate.

Some experiments have also been conducted at Agassiz with cattle, sheep and swine.

#### FRUIT GROWING AT AGASSIZ.

The fruit orchards at Agassiz now contain probably the largest number of varieties to be found in any one locality in the world. The large fruits alone include over 2,000 varieties. The object in view in bringing together this large number is

to gain experience with all varieties. We find people settling here from different countries in Europe, inquiring about the particular varieties of fruit they have been accustomed to grow in their own country, and information on such points is much appreciated. Further, we are testing varieties from all parts, so that we may find out which will succeed best in this country. Our superintendent, Mr. Sharpe, reported last year on 92 varieties of apples which had fruited with him for the first time, and he had a great deal of success with them; he has also reported on a considerable number of new varieties of pears, plums, and cherries and a large number of different sorts of small fruits. Some new varieties of plums introduced by us from France four or five years ago have been found to be eminently adapted to the climate of British Columbia, and have produced large crops. The same may be said of some varieties of pears.

*By Mr. McMillan :*

Q. Have you any experience in growing fruit trees in British Columbia on the sides of the mountains, high up from the valleys?

A. Yes, we have orchards of fruit trees at different heights, 150 feet, 500 feet, 800 feet, and 1,100 feet above the valley, and in going over these last autumn I had an opportunity of testing the fruit grown at these different heights. I found that the higher up the fruits were grown the healthier were the trees, the foliage also was freer from fungus growths. I found that gooseberries grown on these higher locations were quite free from mildew while those grown in the valley were badly affected. The work in the culture of large fruits here, covers all the varieties of apples, pears, plums, cherries, peaches, apricots, &c., including in all over 2,000 varieties. Of small fruits there must be in addition at least 1,000 varieties. The work in the testing of forest and ornamental trees and shrubs has also been continued, and much information and experience gained as to the usefulness of some of our eastern timber trees in that climate. This closes what I have to say regarding the work in progress at the branch experimental farms.

INFORMATION ISSUED FROM THE FARMS.

Before I conclude I wish to mention one thing in connection with the work of the central and branch experimental farms, which the general public seem slow to recognize, that is the very large amount of work done by the officers of these farms in imparting information to the public generally, and this work is constantly increasing. Last year the correspondence received at the central experimental farm reached a total of 57,204 letters. 25,147 of these were answered, the other 32,000 were such communications as could be replied to by circulars partly or wholly printed. More than 150,000 of printed circulars were sent out. At Nappan 1,573 letters were received, and answers were sent to 1,384; at Brandon 4,670 letters were received, and 3,584 answered; at Indian Head 4,702 letters were received, and 5,075 letters sent out; while at Agassiz 1,520 letters were received, and 1,400 answered. This represents a sum total of nearly 70,000 letters received at the experimental farms last year, of which 36,590 had written replies sent to them. In addition 215,000 bulletins and reports were sent out. There is thus a constant flow of information going out from all the experimental farms to the public from day to day all through the year, which has already produced eminently good results; and which must in time confer still greater benefits on the agricultural interests of Canada.

*By Mr. McGregor :*

Q. In planting an orchard in the west would you rather plant in the spring or the fall.

A. Our experience here is altogether in favour of spring planting. I understand that you are speaking of Western Ontario?



Q. Yes?

A. While your conditions in Western Ontario are very different from ours, and in some seasons it would be quite safe to plant trees in the fall, yet as you are never sure of the kind of winter you are going to have, I think it is much safer to plant in the spring.

Having read over the preceding transcript of my evidence I find it correct.

WM. SAUNDERS,  
Director Dominion Experimental Farms.

## THE FARM PESTS OF INSECT LIFE.

COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
Tuesday, 6th June, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 a.m., Mr. Bain, Chairman, presiding.

Dr. JAMES FLETCHER, Entomologist and Botanist, being present at the request of the committee, made the following statement :—

Mr. CHAIRMAN AND GENTLEMEN,—In the department of insects and plants, which is under my care, during the past year it has been of course necessary to attend to the regularly recurring pests of every year, and I am happy to say there is no new pest of importance which has to be reported upon ; but every year there are certain of the well known pests which occur in increased numbers or which require special attention.

At the present time there is probably no insect more in the public mind than the tent caterpillar, which is destroying the foliage of large numbers of forest and ornamental trees, and also of fruit trees in orchards. This is a well known insect, and everything that can be known about its life-history is already well-known, as well as the remedies to be used against it. Though it is difficult to get at all, from the insect being found over large areas and particularly when they attack forest trees, still the place where most of the harm is done is in our orchards, and I have no hesitation in saying that the damage done by these insects is much more than it should be and would be, if people would only treat the study of injurious insects as they do other lines of business which affect their prosperity.

## THE TENT CATERPILLAR.

One great trouble about this and other injurious insects is the prevailing ignorance of the great mass of the people of the country. This is a state of affairs for which there is no excuse, because there is no branch of science which means more to them than the study of insects, and it is a marvel to me that more attention is not paid to it. The subject is taught in schools and colleges to some extent, but on the whole there is great ignorance of this branch of science. The ignorance is appalling in regard to this very common insect, the tent caterpillar, which I have just mentioned. Now, I have had three letters this morning in reference to the tent caterpillar in all of which it is inaccurately named, although it is an insect which has been known for over a hundred years ; and I think that as we lose at least one-tenth of our crops every year from injurious insects, it is about time the people should know something about how to distinguish between a caterpillar, a worm, a bug or a moth, but they do not, and they have to pay for it. Now, I do not mind ignorance in any man if he has nothing to lose by it, but when he does suffer loss from not knowing the commonest crop pests so as to inquire about them intelligently and others suffer also, this ignorance is deplorable. In all business matters that affect my pocket, I take good care to know everything about them as soon as possible ; but it is not so with many in regard to insect pests which annually cause so much loss.

In one of the letters I received this morning I find the tent caterpillar described as a moth. Luckily a specimen came with the letter, and I knew what

the man meant, but if the specimen had not come I could not have conceived what was meant, especially as he said that it "cut the trees down." Now it does not cut the trees down, but it eats the foliage off them, and that is probably what he means. In another letter the tent caterpillar is spoken of as a worm, in another as a slug, both very inaccurate descriptions, but quite similar to others given not only of these but of many other insects. I embrace with pleasure every year this opportunity to come up before the committee on agriculture to speak a few timely words about these insect pests to men who are going out among their constituents in all parts of Canada, and who can remind them, when their crops are attacked by insects, to whom they can apply for help, and also because it is a committee whose proceedings appear in the newspapers and are read by many, so that it seems to me a proper time to speak a word of warning about the pests which cause loss at this season. If I spoke of nothing new at all, I think it would be well worth the time of the committee to hear something about the latest remedies for many of our common crop enemies.

#### SAN JOSÉ SCALE—TREATMENT.

There are one or two problems which demand discussion at the present time, and one of these is the most important subject with regard to injurious insects which has ever yet been discussed by the public in Canada, that is the treatment of the San José scale. Now this is a matter of importance, because, in the United States, enormous losses occur every year from the attacks of this insect, notwithstanding all that has been done to control it. It has also occurred in a few places in Canada, in the extreme south-west of Ontario and in the Niagara district, where it has done most harm and where the largest amount of money has been spent in controlling it. It has become a matter of importance because the Ontario government has spent a large amount of money and put forth special efforts to stop the spread of this pest. But these efforts have been misunderstood by the fruit growers, for whom they were put forth, and even to-day, after much money has been wisely spent in exterminating this pest, letters appear in the papers from fruit growers stating that these efforts are misguided and that more harm is being done than good. Now in the *Toronto Globe*, one of our leading newspapers, a letter has appeared, anonymous of course; people who write these letters never sign their names. This one calls himself "Pro Bono Publico," for the public good; I hope the gentleman who wrote this will some day feel so clear as to what may be for the public good that he will only write such letters as he is not ashamed to sign. The letter is reasonable enough in some particulars, but it has so many inaccuracies in it that it will do much harm. Now, as this letter has been widely circulated and has not yet been contradicted or criticised, and because as I say much of it is reasonable, though it has so many unfortunate mistakes, I take this opportunity to answer it publicly. The writer condemns the action of the Ontario government in the way they treated orchards infested by the San José scale, and I might here state what that action was. The government sent out inspectors to all such portions of the province as they thought were liable to be affected by this most injurious insect, and I lay stress on its pernicious nature: no other insect which has ever been studied has done so much harm as this small scale insect which, as I treated of it fully last year, I shall not say much about now, except that it is very inconspicuous and thus easily overlooked, is very fatal to the trees it occurs upon, spreads with great rapidity, and is more difficult to control than any other insect pest we have yet had to deal with. The Ontario government recognized early the injury which this insect had done in the United States and might do in Canada, and the Minister of Agriculture sent a specialist to the States to study it. He then, after due consultation, put in force an Act with the idea of controlling it. But this, after a year's experience, was thought not to be sufficient, and this year the Act was amended so that the inspectors have more power to carry out its provisions. Now, the letter referred to states that the scale insect is prevalent over such a large area in Canada that we cannot possibly succeed in eradicating it. But such I believe is not the case. This plague is confined in Canada to certain restricted sections of the province of Ontario, and every reasonable and wise effort has been put forth to control the insect



by not allowing it to spread from that area. Where it is very abundant, trees are condemned and destroyed, and compensation is given to the owner of the trees so that he may not have to meet too serious a loss. I had the honour last year of speaking to you on this matter, and I think the fruit growers should thank and not condemn the Ontario government for what it has done. The compensation should be looked upon as a bonus because this is so dangerous a pest that if the government had destroyed every one of the trees and given nothing, the world would say it was hard luck but only what should be done. The Ontario government have fortunately secured excellent inspectors, who have done their work thoroughly. They have visited all parts of the province to which it was known trees from infested nurseries in the United States had been sent.

I believe that nearly every orchard in Ontario where the scale occurs has been located and that its spread has been prevented. The statement that it has spread all through the country is inaccurate. But though a small area only is now affected, we do not know that the insect would not thrive elsewhere. We have made mistakes in the past as to the places where it could exist as an injurious pest; therefore it is wise to be on the safe side, and take no risks in the way of relaxing our efforts to control it in the most effective manner.

All of the best authorities who have had opportunities of studying this pest agree that digging up and burning trees found to be infested is the only certain way of eradicating this enemy; but some fruit growers, and among them the writer of our letter claim that they should be allowed to treat their trees instead of destroying them, as has been done by the government inspectors.

Now, then, with regard to this treatment. Should fruit growers, the ordinary fruit growers of the country, be allowed to treat their trees instead of having them destroyed? I say most emphatically "No." This is an exceedingly difficult insect to fight against. The very best men we have have been experimenting for eight or ten years to find out the best remedy. And although one or two of the leading entomologists in the United States to-day claim that they are able to thoroughly destroy this insect, there are frequent instances where we find that they have failed; therefore we must take what they say with caution. This certainly is not an insect which should be given any benefit of a doubt; or rather the prosperity of the whole country should not hang on the chance of whether the ordinary fruit growers and farmers in the country have skill and willingness to take the trouble to treat their trees properly and thoroughly. If it was an ordinary pest, as is claimed in this letter, then the government would not make these strenuous efforts to control it. But it is not an ordinary pest. It does a great deal of harm, and I consider that the Minister of Agriculture of Ontario has adopted a wise measure, and what he has done up to the present has been the best thing that could be done under the circumstances. Now it is claimed that trees should be treated and that this treatment would be sufficient to destroy the insects, because some success has attended the efforts of the specialists in the United States; but I say that it would be time to discuss that when more thorough investigation has been made. I say the time has not yet come when we can with safety adopt this principle. The Minister of Agriculture of Ontario is not only destroying the trees, but has specialists examining into every treatment yet devised, is watching the whole matter carefully, and is taking every precaution. He has specialists, I say, examining into all the remedies proposed. He has a full plant for fumigating the trees, and, although he does not allow men who are growing fruit in Ontario, the fruit growers, to risk the prosperity of the whole country by undertaking these experiments themselves, he is having that work carried on by specialists and is ready at the very first moment he can find a sure remedy to relax his act so that the less drastic remedy may be used instead of destruction. This is a matter that I think we should speak very definitely and very distinctly upon, because here is a definite statement in which it is demanded that the act shall be repealed and the country left to take its chances.

## PERNICIOUS TEACHING.

The letter referred to says :—"So that the alternative is this—shall we have orchards with the scale a comparatively harmless pest, or shall we have no orchards in the country? The scale is a comparatively harmless affair, nor nearly so pernicious as the yellows or the rose leaf. I was in an orchard the other day which had just been cut down by order of the inspector. The owner told me it had been infested with the scale since it was planted out, eight years ago, and yet you could not find healthier and more vigorous trees anywhere. They were the finest looking trees I ever saw, and yet that magnificent orchard was cut down because the scale was found on about one in every eight of the trees. If the orchard had been allowed to stand, it would probably have lived almost to its natural age without the fruit being injured in the least, if proper sprays had been judiciously used. In no other part of the continent do they resort to these drastic measures for destroying the scale, so far as I have learned. In California they have had it for nearly thirty years and they regard it with comparative indifference.

"And here, again, if the scale could be got rid of by the measures adopted by the government, we would soon have it again, as long as the scale is not being destroyed in New York State, which is just across the river from us. The orchards of that state are not much more than half a mile from our orchards on this side of the river. The scale is as bad there as it is here, and they are not such fools as to cut down their orchards on account of the scale. So that, as long as we have any orchards on this side of the river, the scale will be carried from the other side by the birds which are continually crossing.

"Now, this attempt to do the impossible is costing the province a good deal of money, besides almost ruining this part of the county. In many a case the accumulations of a lifetime have been put into a fruit farm perhaps by men who are incapable of any other kind of farming, and then just as their orchards are beginning to yield a full crop they are ruthlessly destroyed in the fruitless attempt to get rid of a pest which would be incapable of much mischief if properly sprayed. As a consequence, our fruit growers will have no source of income, for the farms are, many of them, too small for general farming, even if their owners could adjust themselves to the new role.

"Now, there is only one rational and fair thing to do. Let the operation of this Act, which is making such havoc in this part of the province, be at once suspended, and let a fair compensation be given to those fruit growers whose property has been destroyed, and when the House meets again let it at once repeal the Act. The condemnation of the Act is well nigh unanimous throughout this section of the country, and just as fast as the scale travels this denunciation of cutting down the orchards will travel with it. Just as soon as any fruit-raiser learns that his own orchards are condemned he at once joins in the chorus of denunciation, no matter how ardently he has supported the Act up to that time. As long as the Act only affects other people it is all right, but as soon as it strikes home it is all wrong. Whatever is done should be done quickly, as all our best orchards are fast being destroyed. It is only a question of time and the government will have to arrest this wholesale destruction of the fruit industry. Why not do so at once before the mischief becomes irreparable?"

It is not an attempt to do the impossible. A sufficient amount of success, a very large amount of success, has attended the efforts of the Ontario government, and I think that in the meantime these efforts should be continued on exactly the same lines that have been adopted. The Minister is watching the matter carefully himself and through his specialists, and directly a successful remedy can be found this will be adopted instead of the total destruction of the trees.

## CATERPILLARS.

I will now speak of the caterpillars which are destroying so many trees. The reason they have done so much damage to cultivated trees is because generally people hitherto have not understood that this insect can be destroyed if attended to



at the right time. The life history of the tent caterpillar is well-known. The eggs are laid in July; the young caterpillars form in a few weeks and remain in the egg until the following year. The next spring after a few warm days they hatch and appear on the trees destroying the young leaves as they expand. The warm weather in the spring hatches the young caterpillars and at the same time the young of two others of our most destructive insect pests, the eye-spotted bud-moth, and the canker worm. These are hatched during the first warm days of spring, but the leaves and foliage of the trees do not respond as quickly to this warm weather in April and May, and consequently the caterpillars are hatched before the leaves have formed. That means that the caterpillars are not always retarded to the same degree that foliage and plant life are, and consequently a few warm days in spring followed by colder weather have the effect of allowing the injurious enemies of fruit trees to be hatched out while the foliage is held back. This is sometimes deceptive, and it was said this year that there would be no caterpillars; consequently, when they wakened up to the fact that there were a great many, some people didn't understand, and wasted time writing to learn the meaning of it. It does not help our fruit growers and orchardists to be looking for a solution of a problem like this, when they should be attending to the application of the remedies for the pest. It does not matter much to the fruit grower how this occurred. The point for him is how to apply the remedies that are known to be effective, for fruit farming requires constant care and prompt timely action. The fruit grower must watch with unremitting attention all through the spring for injurious insects. The old days when no one had to take any steps at all to prevent fruit trees being destroyed have passed by, and during the ten or fifteen years that have lately passed it has been found necessary as a rule to do something every year to destroy the hordes of insects which attack almost every crop we grow. In the old days, before the forests were destroyed, the injurious insects had in the wild plants sufficient food to prevent them coming into the orchards and gardens. But since the forests disappeared the insects have increased enormously from finding suitable food in large areas, and consequently there has been increased difficulty in growing uninjured crops. A great deal of special study has been devoted to this branch of agriculture, and we now have practical remedies for most injurious insects which attack crops. It has been considered expedient in all the experimental stations and agricultural institutions, to issue at short intervals what are called spraying calendars, a means of ready reference for fruit growers and farmers to learn the chief injurious insects each year and the best and most practical remedies for each, with a note as to the time of year to apply them. This is a copy of our last spraying calendar, which we issued this spring for our correspondents; there is of course every year a very large demand for it. This year we were fortunate enough to make arrangement with the *Canadian Horticulturist*, by which we sent copies to all their five thousand subscribers, and in that way we have got copies into the hands of most of the fruit growers in the country quite early in the season, thus providing them with means of fighting the chief injurious insects liable to give them trouble and cause loss. Of course there are others which do not occur on this condensed list, but fruit growers are now learning that there is a source of reference for reliable information in regard to the various injurious insects, at the Central Experimental Farm. All we ask is that they will write promptly on the first appearance of the injury and send specimens so that we can tell what it is caused by. Owing to the ignorance of insect life to which I have referred, the descriptions are sometimes very inaccurate and hard to understand. We therefore ask to have specimens sent and have been fortunate enough to make arrangements with the Post Office Department by which there is no trouble in sending them. All that is necessary is to wrap them up and send them to the department. There is little trouble and no expense to the sender as they are forwarded post free. On these calendars are given the different chief crops and insects and fungi which attack them, then short accounts of the different substances used to destroy the insects, and to control the various diseases.

These are drawn up in the simplest language that can be found, and I think they are intelligible to any one that likes to know about these matters. In the annual



reports and bulletins sent out from the farm we try to make known promptly the best remedies that have been discovered for these pests. There are, of course, with regard to every insect a great many remedies which have been tried and which have been exploited in the agricultural and daily press of the country, but unfortunately many of these remedies which are frequently recommended are not of very much use. It is wise, therefore, for those who follow the business of farming or fruit growing to follow very closely these reports and bulletins which teach them the best remedy to use under certain circumstances. I have put together a few notes so as to refer briefly to some of the worst enemies which are likely to occur at this time of the year, because many people are looking for information regarding them.

#### THE ROCKY MOUNTAIN LOCUST—REMEDIES.

Last year there was considerable interest in the reappearance of what was supposed to be the Rocky Mountain locust in southern Manitoba. Any one who can remember the damage these insects did in 1868, 1870, 1872 and 1874, will know what a curse to that whole country the invasion of these locusts was, how everything that was green was stripped and the great suffering among the settlers which followed from the visitation. Therefore it was not surprising that last year when in southern Manitoba there was an outbreak of what was supposed to be, and no doubt was, the Rocky Mountain locust, there was a great deal of anxiety on the part of the farmers and of the Manitoba government. I was passing through Manitoba during the summer, and was requested by Mr. Fisher, Minister of Agriculture, and Mr. Greenway, Premier of Manitoba, to visit the district and see if this was, as stated in the newspaper press, the real Rocky Mountain locust, or whether it was only one of the less dangerous native species, and if so what could be done to remedy the evil. It was thought that because this insect was small and very similar to the ordinary grasshopper it was not the real Rocky Mountain locust. Sufficient of its life history and habits were known by the settlers there to know that it was a matter of a great deal of importance to be able to ascertain the exact identity of this insect, because it is well known that the Rocky Mountain locust has a far greater power for evil than any other of the native insects. Of course it was only a matter of a moment after once securing a specimen to find out that it was the real Rocky Mountain locust and to warn the farmers that, unless active steps were promptly taken, they would this year have a great deal of trouble from the large number that would be present in the wheat and oat fields.

The season last year was exceedingly dry, so that much of the grain which was sown quite early did not germinate until late in June, therefore on every field there was a double crop; a few grains that had been placed to a sufficient depth in the soil germinated early, but the large proportion, probably 50 or 75 per cent of the grain was not sufficiently covered with soil to obtain moisture enough to germinate and was only just coming up at the end of June when the others were far advanced. There had been no rain from the autumn before until June of last year, consequently there was a great deal of anxiety as to how the crop would turn out, because it was thought that the first crop would be so small and that the later crop would be late and probably injured by frost or destroyed by the grasshoppers. A large area of this, however, on account of the recuperative properties of the climate and soil being so great did come forward, and on account of the absence of early frosts in autumn a good crop was reaped in localities where it was feared in the spring there would be no crop at all. I do not fear such bad results from the visit of the Rocky Mountain locust now that so many farmers have learned what to do under the circumstances. It is known that where the eggs are laid in large quantities injury must be expected in the following year, and as the farmers were warned to be on the lookout they were able to ascertain the localities where the eggs were laid. We know that the eggs are laid chiefly in the stubble fields and not on the open prairie, consequently even in such a large extent of country as we have in southern Manitoba the remedy is practicable. The eggs, as I have said, are laid in the stubble, consequently if the farmers would plough the stubble either in the autumn or early in the spring, the eggs which are laid within an inch or two of the surface are

buried down very deep, so deep that when the delicate young locust is hatched from the egg, it is unable to emerge from the depth of soil beneath which they are buried, or, if they do, there is nothing on the surface of the ground for them to feed upon. Therefore they starve before they can travel by hopping to where there may be food for them. They are of course very small when they first emerge, and the sun during the latter part of May and early in June is extremely hot ; so no insect that has to hop and is very small can go very far before being destroyed by the very hot sun and by the want of food. The ploughing under of the eggs has been found the most effective of all the remedies tried.

*By Mr. Wilson :*

Q. And that is the best remedy they have found ?

A. Yes.

Q. How would burning the stubble do ?

A. It would not do equally well for this reason. The eggs are too far down in the ground to be destroyed by the burning of the stubble. The burning of the stubble is, however, adopted there for some other insects, and because up there they do not use all the straw they grow, they frequently burn over the stubble to destroy weed seeds. It is not absolutely necessary to plough in the fall, as ploughing in the spring will answer the same purpose if it is done early enough, so that the soil becomes consolidated by the rains and winds and the young locusts are unable to emerge when they hatch. If the ploughing is not done, hopper dozers are used very extensively in Minnesota, Dakota and other parts. They have not been used on this side of the line, but it is possible that some of our farmers in Manitoba may find it advantageous to use them this season if the land has not been ploughed ; I think the farmers of southern Manitoba are sufficiently awakened up to attend to the matter. I do not want to make any prophecies at all, but I am in no fear of a general outbreak as some of the farmers feared last year on account of the number of grasshoppers in the fields during the month of July last. It was noticed that not many eggs were laid during the egg-laying season, as the weather turned cold about the time of egg-laying and the eggs were not laid in as large numbers as might have been expected, consequently the outbreak may not be so great this year. Several of my correspondents have been taking a great deal of trouble to find out where the insects had laid their eggs and to warn the farmers there that, if they appear in numbers, the matter should be attended to at once. One danger is that stubble fields intended for summer-fallowing may be left until after the young locusts hatch. If this is noticed these fields will require ploughing as soon as possible, and, if done while the insects are small, a great many will be destroyed. The ploughing should begin at the outside of the field and gradually work towards the centre. In that way farmers can destroy large numbers of them. That is, the land should be ploughed early in June so as to plough down the young locusts as soon as possible after they hatch from the egg.

Another remedy which was used by Mr. Scott, near Deloraine, was spreading long rows of straw across the fields where the young locusts were abundant. It was found that they gathered in these for shelter ; so at night by firing the rows of straw after dark he managed to kill bushels of these insects. Mr. Scott's farm was specially infested and full particulars of this case are contained in the last report of the Experimental Farms. I have nothing more to say on this subject unless any one wishes to ask a question.

#### WHEAT STEM MAGGOT.

During my investigations of insect pests in Manitoba last year a subject on which a great deal of curiosity existed was cleared up to some extent, that is the injury to wheat known as "dead heads" or "white heads" in wheat. Various theories have been advanced as to the cause of this, one that it is fungus. The word "fungus" seems to be a sort of an explanation for everything, and when nothing is known about

some growth the first thing you hear said about it is that it is a fungus or a fungous disease. There is no word more commonly used among badly informed people as an explanation of something they know nothing about ; it is something they know nothing about ; it is something like the word evolution. When a dabbler in science does not understand something he generally says it is to be explained by evolution ; and it is so with the word fungus. Farmers say "It is a fungous disease, and we must trust to Providence to remove it." The "dead heads" or "white heads" in Manitoba wheat are due, however to a large extent to the wheat stem maggot, one of the well known pests of eastern Canada, and one concerning which I will only say that, though its injuries may sometimes be rather severe, it disappears periodically and is not likely to be injurious to any great extent in the future. The perfect fly is abundant on the prairies in Manitoba, where the maggots doubtless feed on the stems of various kinds of wild grass. It is only recently that it has taken to the habit of eating the wheat stems. This is undoubtedly due to the climatic conditions which develop the wheat plant to a suitable condition at the time the flies lay their eggs ; though the injury, in places the year before last was five per cent, the pest disappeared in most sections last season, and I do not think it is going to be a serious cause of injury in the future.

*By Mr. Rogers :*

Q. Is that the same maggot that attacks timothy ?

A. No, sir, it is a different thing, but has occasionally the same appearance. The insect which attacks timothy is a true plant bug, which sucks the sap from the stem by a puncture, and the puncture is made where the soft fleshy part of the stem is, where there is most sap. The sap is sucked out and the top of the stem dies. In Ontario it is particularly noticeable also in June grass ; we find it mostly in pastures which have been left down too long. It is the same in timothy, because when left too long in grass the insects increase and more injury is done. The weather has nothing to do with this injury ; we have had wet weather and the injury has gone on just the same. It is the juicy soft part of the stem which is attractive to the plant bug.

*By Mr. Semple :*

Q. Did you find white heads as common in strong, well cultivated fields as in poorer ones ?

A. In Manitoba you mean, yes. It was just the same ; there was no difference. It was local, but the vigour of the crop did not affect it. One particular crop I saw near Rounthwaite was a very beautiful and vigorous crop of wheat, which had many of these white heads, and across the road in another crop there were none. I could not learn that there had been any difference in treatment except that the land was not broken for a year after the other, but that was not enough to account for this. Probably the condition of the wheat, that is when the head came out of the sheath, was a little different in the two crops when the females were laying their eggs.

#### CUTWORMS.

Among the constantly recurring field pests are the cutworms, now doing such harm. I have a little contrivance here that I would like to exhibit, because it is one that any one can make, which protects the plants after they are planted out, especially tomatoes or cabbages. You can buy them in Ottawa of an enterprising firm for \$1 a thousand.

*By Mr. Wilson :*

Q. What are they made of ?

A. Ordinary stiff paper. Of course the maker would advertise that it is a special paper, perhaps a waterproof paper, but ordinary stiff paper would answer



just as well. This has a slit at one end with a tongue at the other which fits into it from the outside. The paper is bent round and the tongue in one end is put through the slit in the other, forming a ring. As you know cut worms cannot climb up smooth surfaces, and this is certainly a smooth surface. They use to a large extent practically the same remedy in Prince Edward county, where they use tin, but it is more expensive and more difficult to store, while these are so cheap that one need never be without them.

Q. How far are they above the ground?

A. Half an inch below the ground and  $2\frac{1}{2}$  inches above. In his advertisement the maker states that they are excellent for protecting young tobacco plants against frost.

Q. They are about three inches wide?

A. Two inches and a half perhaps, but it is a very good and simple affair and is the same remedy exactly as is used by many growers, of pieces of paper wrapped loosely round the stems of transplanted plants so as to leave an inch or two above the ground. We have used these for years on the farm and they have given satisfaction. One year an experiment was tried of planting 2,000 cabbages on one field. Three-fourths of these were papered and saved almost without a single failure, while the whole of the others which were unprotected were lost, and the only protection was an ordinary piece of paper. We have tried many forms of improved tarred and oiled paper but ordinary paper answers sufficiently to prevent enormous loss from cut-worms.

*By Mr. Featherston :*

Q. Did you ever try salt?

A. Yes ; it is practically no use at all. Salt as a remedy is very much recommended and very much used. It is a slight stimulant to cabbage, because cabbage is a sea plant, but it is practically useless against cut-worms. Lime is another thing very largely recommended but of little value.

#### ROOT MAGGOTS.—HOW TO CHECK.

Among the very worst pests which injure the crops of the field and garden are the root maggots, which every year destroy large quantities of turnips, radishes, onions, early cabbages and cauliflowers. It is not at all an unusual thing for a gardener to have to plant the whole of his cauliflowers or radishes over again. I am now trying some experiments with radishes ; I left a whole row untreated and I do not think there is one that is not destroyed by the root maggots. Experiments are being carried on which vary in the use of remedies, but I am not prepared to state what the results of these are as yet. Many remedies have been tried which are spoken highly of and much written up in newspapers and other publications and have been found wanting. If a remedy is recommended and puffed before it is known sufficiently and fully tested, great harm may be done. Where market gardeners grow large areas under certain crops, and where they rely on a remedy, particularly if, as is sometimes the case, it costs a good deal of money for materials and labour, much harm is done by giving the wrong remedy. First of all, the man loses his crop and the use of his land ; besides this, he loses his confidence in all remedies for injurious insects, and every one who sees the failure knows it is a failure ; thus the whole cause is discredited and great injury may be done. Therefore, I am not very anxious to give out remedies before they are well tested and it is quite time to do so, because far too much of this bad work is being done to-day simply for a little cheap credit.

With regard to the protection of cauliflowers and cabbages against maggots, I have here another little contrivance which I wish to show to the committee. It is called the "Goff tarred-paper card." In the course of his experiments at one of the United States agricultural college stations, Mr. Goff devised this apparatus. It was known that carbolic acid had a very repellant effect on many insects, particularly on the root maggots. Mr. Goff conceived the idea of putting tarred paper,

which has a strong odour, around the young plants at the time of planting. As you see, these are hexagonal pieces of ordinary tarred building paper, three inches in diameter, with a slit from one angle to the centre, where there is a star-shaped perforation to allow the placing of the card around the stem of the young cabbage. The reason it is star-shaped is to allow the little points to stick up and fit back closely against the stem. If this appliance is placed around the cabbages when planted, no eggs are laid by the fly from which the maggots come, and consequently the young plant is protected until it is strong, or it is too late for the flies to lay their eggs. I do not think these are made in Canada now, but it is such a simple matter, and a punch for cutting them out is so easily made, that I suppose any man of ingenuity could make them. We had very good results last year in the use of these cards, and we are using them in large number this season. I received a large box of them as a present to the department from Prof. Slingerland, of Cornell University.

#### REMEDY FOR CUTWORMS.

Before I leave this subject I wish to speak again of a remedy for cutworms, which do so much harm every year by cutting off young cabbages as soon as they are set out. In the last report of this committee or the report of the year before, I mentioned a mixture of bran and Paris green for the destruction of cutworms. I have tried it again this year and can only describe its effects as remarkable. It seems strange that a caterpillar which feeds on green vegetable matter will pass by the green leaves and eat poisoned bran, but such proves to be the case. By sprinkling between the rows to be protected a mixture of wheat bran dampened sufficiently with water or sugar and water to make the Paris green adhere to it, and enough Paris green dusted into the mixture to give it a green tinge, we find that the cutworms will eat the poisoned mixture and that from the time the poison is set out the plants are left uninjured. During the last month I have tested this remedy thoroughly and with the greatest possible success on all kinds of vegetables, and I do not think that half a dozen have been eaten since the bait was put out. Before that fifty and sixty plants a night were eaten in rows of pease, beets, carrots, onions, &c. The bran has been eaten and the caterpillars are dead.

*By Mr. Rogers :*

Q. Is it any better than the paper band ?

A. It is for plants grown in a different way, that is in rows as carrots, onions, beets, beans, &c. It may also be used in corn fields by putting a very small quantity on the hills.

Q. Is it any good for caterpillars ?

A. Yes, cutworms are caterpillars—the caterpillars of a class of night-flying moths.

*By Mr. Wilson :*

Q. You take the wheat bran and put on enough Paris green to give a green colour ?

A. Yes, after dampening the bran a little, if this heavy poison is put into perfectly dry bran, it sifts through it to the bottom, when it is stirred for mixing.

Q. You do not give the specific quantities ?

A. No, it is a remedy that does not require particular directions as to quantities, if there were an excess of Paris green the caterpillars would eat it just the same, and it would be difficult to injure the plants, because it is only put on the ground near them.

*By Mr. McMillan :*

Q. Would that have any effect on the insect that cuts off corn, sometimes right at the ground ?

A. It is the very thing. In Prince Edward county, as I learn from Mr. Pettet, this remedy is now being used extensively by the large growers of tomatoes, who used formerly to use tin bands, which were rather expensive and were hard to store safely owing to the space they required.

*By Mr. Wilson :*

Q. How long have you been using this remedy ?

A. Four years.

#### THE PEA MOTH—HOW TO PREVENT.

With regard to another insect, which is not abundant in Ontario as a rule, but is very injurious through New Brunswick, Nova Scotia and Quebec, as far up as here, I have a few words to say. I refer to the pea moth. The pea moth or pea maggot, which attacks the green pease in the pod, is a little caterpillar somewhat like that of the codling moth or apple worm, and does a great deal of harm. It is not very pleasant when you find a few of these in a dish of cooked pease ; and sometimes and in some places they are so abundant that people get used to them and don't take much trouble to pick them out of the pease before cooking them. In almost every dish you will find a few boiled, swelled-out maggots, as they are generally called. Now, such discoveries have a tendency to destroy the appetite of a good many people—when they see them, they do not want any more pease ; others profess not to mind them, and eat their delicacies contentedly. This is no new insect. It is not mentioned, however, in any reports on injurious insects, as far as I know, except our own, although it does considerable harm in New York and the states to the south of us. The life history of the insect has been studied out, and we have found that the moth which lays the eggs from which the caterpillars hatch, does not appear until the end of June or beginning of July. To avoid injury by this insect we can, in the case of garden pease for table use at any rate, sow the seed of the earliest varieties with good results, because the moth that lays the eggs does not appear until these pease are ready for use, therefore some of the very early varieties—and there are several good ones which can be grown successfully for a garden crop, can be grown and matured long before any injury is done. I have picked out several varieties of this class, such as the following :—Alaska, American, Wonder, Gregory's Surprise, Gradus, Nott's Excelsior, McLean's Little Gem. Many people do not like the Alaska, because they say it is a very little pea and not worth growing for that reason. However, it is well worth growing. These were ripe on the 17th of June last year, and this year they will probably be ripe as early. These varieties are all of good quality, and were ready and ripe for the table before the 1st of July last year, and add to that another fortnight this year, and we still have an early pea.

*By Mr. Wilson :*

Q. What do you mean by being ripe ?

A. I mean that they were ready for use, for boiling as green pease. Last year it was a very early season, but gave it an extra fortnight this year, and you have all these pease ready before the "pea maggot" can do them any harm, that is, of course, if they are put in early, in this part of Canada at any rate. When we get farther down towards the sea, we find the season a little later as we go east, and the best way there to avoid loss from the insect is the same as here, to choose the very best varieties of early pease, and get them in as early as possible. Pease, as all know, can be put in as soon as you can get on the land, as soon as the ground is thawed out sufficiently deep to put the seed in. The only remedy, then, for the present for this insect, until something else is discovered, is to sow early varieties of pease and get them in as early as possible.

*By Mr. McMillan :*

Q. We got the best results from field pease recently by sowing late. We had the maggot two or three years ago very plentifully, but last season it was not so plentiful ?



A. That, Mr. McMillan, I believe arose from the reason that the moth appears at a certain time, and there is only one period in the year when the insects are ready to lay their eggs. The females lay their eggs on the pods that are young and in a suitable condition for the young caterpillars to eat their way in and get at the forming seeds; so, by sowing either early or late, the pods are not ready at the time the moths are laying the eggs, and consequently the crop does not suffer from the ravages of the insect. Much useful information on this subject has been collected by Mr. Wetmore, of Clifton, N.B., and again this year at my request he is going to try spraying his pease in the same way we do apple trees for the codling moth. It is possible that this may be a good remedy for garden use, but might be found rather difficult for the pea crop growing in the field, because the vines cover the ground so thickly. But the result of his experiments will be valuable, because if we can get a good remedy for a garden crop, it is worth having, and ultimately we may be able to apply it to field crops.

#### THE CARROT RUST FLY—TO PREVENT.

Another insect, somewhat new as a crop pest, is the carrot rust fly. This insect, which I am sorry to say is increasing in Canada and giving a great deal of trouble, is a small black fly. It lays its egg near the surface of the ground by the side of the young carrots, particularly after the carrots have been thinned out, that is, when by handling the plants a certain amount of the odour of the plant is given out. The eggs are laid at that time, and the young maggots burrow down, they puncture the root, and serious injury is done by their boring into the roots in every direction, thoroughly ruining them for table use, and certainly not improving them for stock, but probably not injuring them to the same extent as those intended for table use. The only remedy that has given satisfaction with us for getting rid of that insect is late sowing. The carrot is a plant from which good roots may be obtained, if sown very much later than is the usual practice. I found, when in London some years ago, that quite late in the year a very nice lot of tender young carrots were being sold in Covent Garden market, and learnt from one of the growers that they sowed them right up to the month of July, and those which were sown late were better for the market than those of the earlier sowings. With field crops we sow them as early as possible in order to get the largest amount of crop for feed, but when sown for the table they can be sown late, and if they get a little rain, they make good growth, and for table use are much better than those sown earlier in the season.

Experiments have been tried with some success in sowing along the rows different substances odourized with carbolic acid and other materials that have a strong odour, so as to hide the natural odour of the carrot.

#### THE TURNIP APHIS—HOW TO DESTROY IT.

Another insect that did a good deal of harm last season throughout all Canada was the turnip aphis. This is one of the plant-lice or green flies which attacks the turnip, and unfortunately they were very widespread, and the statement went forth, and was generally accepted by farmers, that nothing could be done to prevent loss from its attacks. Now, that is not true; a great deal can be done. When we had a visitation some years ago we found that it was best to let our men who were thinning out the turnips know that they had to look out the turnip aphis. When the men are thinning out the turnips they can easily distinguish the first colonies of the insects, and, whenever a colony is found, if the plant is hoed out and buried by hoeing a little earth over it with the hoe which he has in his hand, the colonies may be prevented from spreading. After hoeing earth over the uprooted plants, it should be firmly pressed down with the foot. When the lice are too numerous for this treatment they should be sprayed with a solution of whale oil soap in the proportion of one pound in eight gallons of water. We have found that whale oil soap is one of the best remedies for all plant-lice, and in that proportion it is useful for nearly

all kinds of plant-lice. In the spraying calendar, which I have submitted, is a soap and tobacco wash, in which tobacco is added, and where this is available the mixture is much more effective. We mix it in an ordinary forty-gallon coal oil barrel in the proportion that I have spoken of, one pound of whale-oil soap to eight gallons of water and two pounds of tobacco. Good's Caustic Potash Soap, No. 3, if obtainable. The native grown tobacco leaf is what we use. If this solution is sprayed on the attacked plants with a knapsack sprayer, the plant-lice are killed. The knapsack sprayer is a most convenient implement for spraying mixtures on all low crops. The worst example of attack by the turnip plant-louse I have seen was at Morden, Manitoba, where whole acres of turnips were destroyed. It was an unusual attack, but steps have been taken to warn the farmers in southern Manitoba to look out for the appearance of this pest should it occur again.

*By Mr. Featherston :*

Q. Had they dry weather during the time the attack was on ?

A. Yes, it was very dry weather.

*By Mr. Moore :*

Q. I think you have not mentioned the insects that prey on the onion.

A. The worst is the root maggot. You mean the one that destroys the bulb, do you not ?

Q. When the onion plant has grown up to three or four inches high you find them cut off.

A. And the bulb all rotton or cut off ?

Q. Cut off ?

A. That is the cut worm. The Paris green and bran mixture is the best for that. The root maggot is a far more serious pest. One of the greatest desiderata is a good remedy for the root maggots of onions and other plants. As I have already said, carbolic is very objectionable to them, and I am trying various mixtures in which there is carbolic acid to determine which is best. A mixture of soap and crude carbolic acid mixed with water has given the best results against the radish maggot. The well known material, white hellebore, used for the currant-worm insects on white and red currants and gooseberries, has also given good results. This is a remedy I expected nothing from, but after two or three trials of it I had such good results that I now feel I can recommend its use. It is dusted dry along the drills as soon as the young plants appear.

#### THE GRAY FRUIT WORM—SPRAYING MIXTURE FOR.

Throughout the province of Ontario last year a good deal of harm was done in apple and pear orchards by certain caterpillars known as the green fruit worms. These are the caterpillars called "Gray Pinions," and they have the bad habit of not only eating the foliage but of attacking the young and forming fruit. This is the time of year that they do most harm. We have not suffered from them this year, and I hope they will not occur again. During the last twenty years we have had to or three visitations of these insects, but they soon disappeared. Last year the green fruit worms were very troublesome in the Niagara peninsula, and also in this locality. In addition to attacking fruit trees, one species attacks maples and other forest trees, and in some places it is so abundant that it strips the trees in the same way as the tent caterpillar.

In British Columbia I found that fruit growers suffered much from the caterpillar of a small moth, which has done a good deal of harm in apple orchards. It is called the "lesser apple-worm" or "plum moth." Last year it did great injury in British Columbia, together with the apple fruit miner, and no remedy was of any avail. Experiments are being tried in spraying the trees with Paris green, as for the codling moth.

*By Mr. Wilson :*

Q. Is it the caterpillar of the codling moth?

A. No, but it answers to it in everything but size. The spray which we recommend is one pound of Paris green and one pound of fresh lime to 100 gallons of water. This should be applied early in the season after the blossoms have fallen and the young fruit has formed. The eggs are laid on the side of the fruit, and when the young caterpillars hatch they crawl over the forming apple till they reach the eye and remain inside the calyx or cup at the end of the fruit. Spraying should be done early, before the calyx closes and the weight of the young apple turns down the calyx end. The young caterpillar remains for some time in the calyx before it penetrates the fruit. This is the time the poison takes effect before it penetrates the fruit when it cannot be reached.

Q. This miner you speak of is in the spring?

A. Yes, but the caterpillars are found all through the summer and autumn in the fruit which they destroy by burrowing in every direction.

Q. What do you use for the tent caterpillars you spoke of?

A. A spray of Paris green in the proportion of one pound to 160 or 200 gallons of water is the best remedy.

Q. It should be applied early?

A. Yes, very early, because the caterpillar is then small and much easier killed. When they are large they require much more poison and it might be necessary to increase the strength of the mixture to one pound of Paris green to 100 gallons of water, with lime in the same quantity as the Paris green. If lime is mixed with arsenical mixtures no injury is done to the foliage and it is just as poisonous to the caterpillars.

*By Mr. McMillan :*

Q. Could nothing be done to keep the caterpillars from getting up the trees?

A. Yes; when they have eaten the foliage off the trees where the eggs were laid and the food supply becomes reduced, they wander; they drop from the trees and crawl long distances. I measured a fortnight ago, where I found one on a fence; it was 300 yards from the nearest tree and it had crawled over grass to get to the fence. They crawl in search of food and they frequently crawl long distances along fences and railway tracks. That is how trains are stopped by them sometimes. I once saw a train stopped by weeds in the North-west. The tracks were not excessively weedy, but there had been a thunderstorm and the weeds were knocked over the track, so that the wheels had nothing to grip on. So if half a dozen caterpillars got on the railway track every few inches or so, I can understand how the wheels might spin round without being able to bite. Most people think when they read about trains being stopped by caterpillars that they are piled up on the track so that the train can't get through them.

*By Mr. Wilson :*

Q. It was reported in this case that they were six inches deep?

A. I believe that that was an exaggeration. I do not think that you could get them six inches deep, and if you did pile them up they would not stay. It reads better to say they were six inches deep than one inch, but I doubt if they were even one inch deep. My weeds when the train was stopped were more than two feet high according to the report; but it was not so; they had simply blown down across the tracks.

*By Mr. McMillan :*

Q. What would you do on the trunk of a tree to prevent them getting up?

A. There are many mechanical contrivances which are good or the banding of the tree either with a band of some easily yielding material, such as cotton batting or some adhesive substance to catch them. The bands of cotton should be tied on



with string about the middle—which gives a yielding surface over which the caterpillars cannot crawl. Many people use protectors of tin or wire netting or bands of castor oil and resin or even molasses spread on paper and tacked around the trees. When the caterpillars come to those they don't walk any further. The mixture of castor oil and resin has been much used and has proved very successful, being thick and sticky, and at the same time it keeps its viscosity a long time. This mixture has been used by Dr. Springer, of Burlington, with great success against the female moths of the cankerworm, which ascend trees in autumn to lay eggs. I think the simplest remedy which every one can use is a band of cotton batting tied around the trees that are not infested to prevent the caterpillars crawling up.

There is now, Mr. Chairman, just one point about grasses I would like to mention if no one has any further questions to ask about insects.

#### APPLE WORM,—WHEN TO SPRAY FOR.

*By Mr. Cargill :*

Q. You do not say what time of year you would spray to prevent the apple worm?

A. As soon as possible after the blossoms fall. This should be repeated three or four times in Western Ontario. In this part of the country we only spray once, as we have only brood of the codling moth. West of Toronto they have two and in the Niagara peninsula apparently three sometimes. Here, I think we may say, we have only one brood and hardly ever two, and west of Toronto two broods and occasionally three.

Q. Would you spray in the spring when the trees first bloom?

A. There would be no advantage in this, and, besides a law has been passed to protect the bees of the apiarist while the trees are in blossom. Most fruit growers find it to their advantage to keep a few bees in their orchards as they help to pollinize the fruit. In spraying it is necessary to have the proper materials and to put them on at the proper times with proper apparatus. This can only be done by finding out the life history of insects and applying these materials in accordance with that knowledge. Most of the most troublesome insects have now their life-histories well known and the best materials for destroying them are also known. Farmers of Canada have our annual reports and spraying calendars, and besides this many persons are writing regularly for information, which we willingly give to the fullest extent possible and on all occasions.

#### PASTURE GRASSES,—SLIDING MIXTURES.

Let me now draw your attention to another subject,—pasture grasses, which are of such interest to farmers. Most seedsmen sell special mixtures, some of which are good and some of which are not. We have tried a great many experiments with different mixtures to find out which would give big crops of hay and then good pasture afterwards.

One mixture which has given us splendid results is the Central Experimental Farm mixture, and the fact that we have christened it after our own institution shows at least that we have confidence in it. It was first used by us on a large area last year when it gave the best result out of twenty different mixtures, but it has been used by my correspondents for several years and all have reported most favourably upon it. It is a mixture for an average farm soil suitable for ordinary crops. It consists of, Timothy, six pounds; Meadow Fescue, four pounds; Orchard Grass, two pounds; Kentucky Blue Grass, one pound; Red Top, one pound; clovers, eight pounds. With the grasses mentioned above are sown two pounds each of the three clovers Alfalfa, Alsike and White Dutch, and one pound each of the two red clovers, Common Red and Mammoth Red. Thus we get eight pounds of clover and fourteen pounds of grass, twenty-two pounds in all. This is about the proper proportion of grass seed to produce a heavy

crop of hay. It gives the heaviest crop of a green fodder or hay of any mixture we have tried. It can be cut for two years as hay and after that gives excellent pasture, as good as any we have tried.

*By Mr. Featherston :*

Q. Is that twenty-two pounds to the acre ?

A. Yes.

Q. What was the number of pounds of each ?

A. Six pounds of Timothy, four pounds of Meadow Fescue, two pounds Orchard Grass, one pound Kentucky Blue Grass, one pound Red Top. Red Top is perhaps not necessary unless the land is low. In that case I generally put it in. If the land is high you may put in two pounds of Kentucky Blue Grass instead of one pound of each, but if the land is low in spots I always put in the red top grass. It is a very valuable soft and rich grass in such places.

Q. How many pounds of clover ?

A. Eight pounds of clover, two pounds of Alfalfa, two pounds of White Dutch, or ordinary White, as it is familiarly called, and one pound each of the common Red and Mammoth Red.

#### TO RECLAIM SAND DRIFTS.

Some rather interesting experiments with regard to grasses have been carried on lately that I would also like to mention. Along the Ottawa river and also along the St. Lawrence are various areas of sand land where the pine timber has been cut down and the wind has had an opportunity of drifting the sand soil, and at one place in particular, near Lachute, there is an area five miles long by one-half to a mile wide that is simply a desert. There is not a blade of grass growing on this sand, and with every wind it shifts from place to place. Not only is this tract useless, but it is spreading over the neighbouring good land, and it is a very serious matter for the farmers living near this tract. Efforts are now being made to see if something cannot be done to hold it down. It is only about forty years since this tract began to appear. As the pine was cut down and the land cultivated, the land got poorer and poorer and the wind got in and now these shifting sands have taken the place of arable lands. I believe it is not a hopeless experiment to recover that land again, because the farmers are all actively interested and some results of a hopeful nature are being obtained from the experiments which are now being tried by the Minister's order as well as by the Department of Agriculture of Quebec, in planting spruce trees. Many farmers there have planted as many as four or five hundred trees in the last spring. Some of the trees were not in the best condition or in the best position, but the farmers are learning every day and are doing a good deal. It is intended to plant the Awnless Brome grass, a free growing vigorous variety of fodder grass of excellent quality, among these trees, which will, I hope, in time recover this desert. We are working from the outside to the centre so as to gradually encroach on the sandy area and prevent it from spreading. Within the memory of people living in the district, as for instance, Dr. T. Christie, M.P., who has shown great interest in having the experiments instituted, this now useless tract of sand was covered with crops, and only the fact that the sand has accumulated in some places and moves so quickly when the wind blows prevents it being done now. Trees are being planted, grass is being grown, the farmers are working in unison, and I hope before long at any rate that some appreciable effects may be seen.

#### FLOODED LANDS.

Experiments are also being made with the object of making use of some alluvial flats on the Ottawa river that are flooded in spring. Vigorous grasses have been planted and better results than formerly have been obtained in getting back into useful grass some flats where the native grasses had been broken up, the whole of the surface

soil was washed away and nothing was left but the sub-soil. By planting these valuable grasses I hope that some of these flats will be brought back into their old good condition, and in addition that the grasses used will be more valuable than the varieties which were originally there.

*By Mr. Wilson :*

Q. Has any effort been made at Prince Edward at the sand banks there to stop that sand from moving?

A. I do not think there has, the elevation there was considered so high that it was thought almost hopeless, and I have never heard of anything being done.

Q. Could there not be some trees planted there?

A. I think there might. There is a peculiarity of those sand banks but it is not a peculiarity after all if you come to consider it. There is always moisture very near the surface, the same as we find where there has been proper summer fallowing or cultivation practised; by scraping away the dry sand from the top you can find moisture underneath. At Lachute we found moisture right underneath the surface only three or four inches down and the trees which grew on that sand are spruces and firs which we all know require a good deal of moisture. The reason why they grew was probably because of this moisture; from the shifting of the surface of the sand it was kept dry and this kept the moisture in and had the same effect as the cultivation of the soil in dry seasons. The trees got all the moisture which they required.

Q. I think it might be very well to plant some trees there?

A. I think so too. I have never been there myself; that is, I have never been very close to the sand hills and never examined them closely, but I think they are of very much the same nature as these sand banks, on the St. Lawrence and Ottawa, and those trees that have been planted and protected against the wind storms that drive the sand which actually cuts them have succeeded well. It is this sand which destroys them, it is not the heat of the sun, nor the lack of fertility in the soil, so much as that they are actually cut down by the sand which is carried by the wind and cuts like a knife.

*By Mr. Featherston :*

Q. Was the exhibition of weeds at Winnipeg a success; I did not hear of any report upon that?

A. It was a tremendous success; although the exhibition was held in simply a shed which was put up, it was of very great service; all the worst weeds of the province were shown there. It was in charge of Mr. McKellar and Mr. C. Braithwaite, particularly energetic, active men, who kept things running all the time and had fresh weeds brought in day by day. More than that, they introduced the idea of having the faded weeds kept side by side with the fresh ones, and the idea was original and a very wise one, for this reason: when a farmer picks a weed he does not generally stop to examine it there and then, but he takes it home and examines it afterwards. I have found that to be the case in my own experience. The farmer carries the weed home and does not stop to examine it, as a rule, when he picks it, but sees it afterwards in its faded condition; and the wisdom of this idea was shown in the fact that there were more weeds actually recognized by farmers in the faded condition than there were of those weeds which were green and which were examined by the farmers in a green state. The success of this exhibition of weeds was shown by the large number of visitors to the tent who brought in weeds for report. During the three days this exhibition was open, there was a constant stream of farmers asking questions and bringing plants, asking information as to what they were. Many others said that if they had known this exhibit was to have been there they would have brought samples of weeds from their own farms in order to find out what they were.

It was instructive also to the officers of the department because they were able to find out from the questions asked and the specimens which were brought in just where and to what extent many of these weeds were distributed of which they had no know-



ledge before. The worst weeds were hung in a conspicuous place across the front of the building, and every weed that is known as a pest and injurious to the crops was represented.

Mr. Braithwaite spent three or four days before the exhibition in collecting specimens for inspection. Rev. W. A. Burman also did special work of value for the department, and the information which was given was very largely sought after and taken advantage of, and the Minister of Agriculture for Manitoba, I believe, has made arrangements for a repetition of the exhibition this year. A full report of this effort will be published by the Hon. Mr. Greenway.

*By Mr. Featherston :*

Q. What about the French weed, some people object to that name?

A. I do not wonder. As I told them in Manitoba a few years ago I do not see why this weed should not be called the English, Irish, Scotch or German weed as well as French. The first year I lectured on weeds for the Manitoba Government was just after the present government came into power; it was said, now, there is a French Canadian Premier here, we have the government botanist going up there to Manitoba and telling them that the Stink weed is not to be called French weed any more, but he has orders to call it by a new name. Of course, this was nonsense, but if there is anything in a name Stink weed is just the name for this plant, as any one can prove for himself by rubbing some in his hands and smelling it. Why it should be called "French weed" I do not know, and I do not wonder that any people object to have their national name applied to a plant which is simply a curse to the province, besides it is just as likely to have originally come from England or Germany as from France.

Q. Some of these people are very sensitive?

A. They are. It takes a very little thing sometimes to make people think something might be done another way and this is one of them. But this time these objections have reason on their side. French weed does not describe the plant accurately and Stink weed does.

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Having read the preceding transcript of my evidence, I find it correct.

JAMES FLETCHER,

*Entomologist and Botanist to the  
Dominion Experimental Farms.*

## FERTILIZERS AND FOOD PRODUCTS.

COMMITTEE ROOM, No. 47,  
HOUSE OF COMMONS,  
OTTAWA, 15th June, 1899.

The Committee on Agriculture and Colonization met this morning at 10.45 a.m., Mr. Bain, the chairman, presiding.

At the request of the committee, Mr. FRANK T. SHUTT, M.A., chemist of the Experimental Farms, attended and made the following statement in reference to the work of the chemical division of the Experimental Farms.

MR. CHAIRMAN AND GENTLEMEN,—As I found it difficult on previous occasions, owing to the limited time at our disposal, to bring before you all the important features of our work for the past year, I have to-day departed from my usual custom and prepared a statement in writing. I think this will enable me to present the matter more concisely, and at the same time, more fully and need not in any way interfere with the custom of asking questions usual on such occasions. Of course I shall be very pleased to answer, to the best of my ability, any questions that may be asked, as we proceed.

*By Mr. Featherston :*

Q. In reading your address I suppose you would prefer to have the questions left until afterwards.

A. That is just as the committee chooses. I shall not deem it an interruption if members ask me questions at the time if it is more convenient for them.

It is my pleasure to be able to report that the work of the chemical division at the Experimental Farms has during the past year proceeded satisfactorily and afforded results of considerable value to Canadian farmers. This work is necessarily of a varied character, for chemical aid is needed in every branch of agriculture: our purposes, however, will be served to-day if we consider it according to the following classification.

1. Original investigations and research work. This includes experiments instituted by the chemical division and chemical work in connection with the experiments conducted by the horticultural, entomological and other divisions of the Central Experimental Farm, as well as at the branch farms. It is scarcely possible to give any typical example of this class of work, but I may cite as of greater importance the determination of the relative fertility of the virgin soils, and of the degree of availability of plant food in certain soils and fertilizers; ascertaining the effect of fermentation upon the elements of fertility in manures and the estimation of the comparative value of certain crops such as clover and of certain naturally occurring fertilizers such as marl, swamp muck, &c., for the improvement and enrichment of soils; the determination of the feeding value of crops and their products. To these classes of research may be added investigations covering the chemistry of insecticides, and fungicides. This is an important matter because the effectiveness and safety with which insecticides and fungicides can be used depend very largely upon their proper preparation; we have numerous instances where much damage has been done to foliage by the use of improperly prepared fungicides and insecticides. Investigations with dairy products, food preservatives, and investigations to ascertain the effect of certain foods on flesh, &c., also receive attention at our hands.

2. The examination of samples of an agricultural nature that have been sent in by farmers and those engaged in one or other of the various special branches of agriculture.
3. Correspondence, writing of reports and bulletins, and the delivery of addresses at agricultural, dairy and horticultural conventions.

1.—ORIGINAL INVESTIGATIONS AND RESEARCH WORK.

This, as might be supposed, makes the first demand upon our time; other work must be taken up as opportunity permits. I shall endeavour to place before you, briefly, an account of the more important results obtained from investigations of this character during the past year.

THE PRESERVATION OF BARNYARD MANURE.

Our report for 1898, recently issued, contains a full account of the results obtained from a somewhat extensive investigation, commenced two years ago, to ascertain: (1) the relative value, weight for weight, of fresh and rotted manure; (2) the losses that occur during rotting under conditions of protection and exposure respectively; (3) the effect of rotting on the availability of the plant food in the manure, and (4) the effect of gypsum as an absorbent of ammonia in the manure heap.

As this work was approaching completion when I addressed the committee last year, I took the opportunity of bringing before you some of the chief results and the deductions that I was able to draw therefrom. It may not therefore be necessary to-day for me to speak of this investigation further than to draw your attention to two tables of data that I have specially prepared, setting forth (1) the weights of fertilizing constituents in the protected and exposed manures at different and stated periods throughout the year of rotting, and (2) the losses, calculated in percentages, of the various fertilizing constituents in the rotting of the manure under the two series of conditions. Table II is calculated from the data furnished in table I.

It will be remembered that the experiment we are now speaking of consisted in the rotting of manure composed of equal parts of horse and cow manure (*a*) in a well built shed with weather-proof sides and roof, and (*b*) in an open bin, the sides and floors of which were double boarded. The former we termed "protected," the latter "exposed." The manures were weighed and analyzed month by month for a year, and the following tables show the results in detail:—

TABLE No. 1.

WEIGHTS OF FERTILIZING CONSTITUENTS IN PROTECTED AND EXPOSED MANURES.

	Fresh.		At end of 3 mos.		At end of 6 mos.		At end of 9 mos.		At end of 12 mos	
	Pro- tected.	Exposed	Pro- tected.	Exposed	Pro- tected.	Exposed	Pro- tected.	Exposed	Pro- tected.	Exposed
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Manure. . . . .	8,000	8,000	2,980	3,903	2,308	4,124	2,224	4,189	2,185	3,838
Organic matter.	1,938	1,938	880	791	803	652	760	648	770	607
Nitrogen. . . . .	48	48	40	34	39	33	37	29	37	31
Phosphoric acid	25	25	25	23	26	22	25	21	24	21
Potash . . . . .	62	62	65	48	59	44	60	41	60	40



TABLE No. 2.

## LOSS OF FERTILIZING CONSTITUENTS IN THE ROTTING OF MANURE.

	At end of 3 mos.		At end of 6 mos.		At end of 9 mos.		At end of 12 mos.	
	Pro- tected.	Exposed	Pro- tected.	Exposed	Pro- tected.	Exposed	Pro- tected.	Exposed
	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
Loss of organic matter.....	55	60	58	65	60	67	60	69
"    nitrogen .....	17	29	19	30	23	40	23	40
"    phosphoric acid.....	None.	8	None.	12	None.	16	4	16
"    potash.....	None.	22	3	29	3	34	3	36
Loss in value per ton of original manure.....	20c.	64c.	27c.	80c.	36c.	90c.	36c.	95c.

Value of fresh manure \$2.61 per ton.

Without reading to you all the data presented in these tables, I think it may suffice if I make mention of some of the more important figures and explain the results that I have deduced from these figures.

Barnyard manure, from its beneficial effect upon the mechanical condition of the soil, and the fact that its application introduces certain bacterial organisms which perform a useful function in setting free inert plant food in the soil, has a value peculiarly its own. But barnyard manure is valued ordinarily according to the percentages of nitrogen, phosphoric acid and potash it contains. That is to say, that if we wish to make a comparative valuation of any pile of manure as contrasted with any quantity of a commercial fertilizer it is usual to estimate the amount of nitrogen, phosphoric acid and potash in that manure and assign to these elements the price which they have in the commercial fertilizer. However, as we know, barnyard manure has an additional value over and above the value of these elements of fertility. To these elements (nitrogen, phosphoric acid and potash) in my opinion we should add organic matter, for it is the constituent which by its decay adds humus to the soil. Humus, as we are aware, is not only the plant's storehouse which prevents undue waste of fertilizing elements, but the constituent that improves the water-holding or moisture-holding capacity of the soil and tends to regulate the soil's temperature, guarding against extremes in both directions.

Now table No. 1 shows the original weights of these constituents when the experiment was started; these are placed in the two first columns. The same amount of manure was experimented with under the protected as under exposed conditions, and as they were alike in composition, the weights of the elements of fertility in both cases were the same.

The first fact that I would draw your attention to is that in the protected manure there was practically no diminution throughout the whole period in the amount of potash and phosphoric acid, showing that there has been no leaching of these elements. The phosphoric acid we started out with practically remained the same—about twenty-five pounds—till the experiment was closed at the end of twelve months.

*By Mr. Featherston:*

Q. That is the original weight?

A. Yes, twenty-five pounds; this is the original weight of phosphoric acid in these manures. The weights at the end of three months are to be found in the third and fourth columns: it will be noticed that at the end of this period there had practically no diminution in the amount of this element. The nitrogen and organic

matter, however, had suffered considerably by fermentation, thus the forty-eight pounds of nitrogen contained in the four tons rotted under protection, had been reduced to forty pounds in the first three months.

Q. How much manure at the outset?

A. We started with four tons in both cases.

Q. That is fresh manure, not rotted?

A. We commenced with fresh manure.

In regard to organic matter the manure at the outset contained 1,938 pounds and this was reduced in the protected manure in three months to 880 pounds, and the nitrogen from 48 pounds to 40 pounds. Now we will contrast that with the result obtained in the exposed manure. The initial amounts were originally the same. In the exposed manure the loss of organic matter and nitrogen was greater than that just cited; that is, the loss of nitrogen and organic matter was greater than in the protected manure. The organic matter, originally 1,938 pounds, was reduced in the exposed manure to 791 pounds; about 90 pounds more organic matter had been destroyed under these conditions than under the conditions of protection. With regard to nitrogen, 48 pounds has been reduced to 34 pounds.

Q. Well, what class of manure was that in the first place?

A. Equal parts of horse and cow manure, taken fresh and put on the pile.

Q. What was the food of the cattle?

A. That is rather hard to say; as we have so many feeding tests going on it would be practically impossible to give the data. Both horses and cattle are liberally fed both as to amount and quality. This was fairly rich manure. This is evident from the chemical analysis of it that we made.

*By Mr. McGregor :*

Q. It was general feed?

A. General good feed, but I should add that great care is taken to preserve liquid manure from waste by a generous use of litter and absorbents. This is a very important affair, more important than many farmers realize, for the liquid manure is the more valuable of the two.

*By Mr. Featherston :*

Q. Cattle fed on meal produce stronger manure?

A. Quite true. I presume, however, that if this manure had been of a poorer quality the loss, while it might not have been so great, would have been in the same ratio.

*By Mr. McMillan :*

Q. Was the manure taken right from the stable to the shed?

A. Yes, though it took us some two or three days to collect the desired amount, namely, eight tons. During that time incipient fermentation had commenced. We should have liked to have avoided that, but it was necessary to work on comparatively speaking, large quantities in order to get results from which to draw safe conclusions.

We have now seen that there was a greater waste of nitrogen and organic matter in the exposed manure than in that which was protected. I have in addition to draw your attention to a very serious loss in potash and a slight one in phosphoric acid in the exposed manure. We commenced with in the neighbourhood of 62 pounds of potash. In the exposed manure at the end of three months we found that that 62 pounds of potash had been reduced to 48 pounds. We also found that there had been some leaching of phosphoric acid; we started with 25 pounds and this had been reduced to 23 pounds, not a very serious loss, but sufficient to show there was a leaching away under these conditions of a certain quantity of this important element of plant food.

*By Mr. Featherston :*

Q. But you had not practically any phosphoric acid or potash loss in the protected manure?

A. Quite so, that is what I wish to emphasize. This loss of potash in the exposed manure occurred in spite of the fact that the walls and floor of the bin were double boarded. So I think we may conclude it is impossible to prevent loss from leaching of potash, unless we put the manure in concrete pits or in pits containing a thick bed of some absorbents such as air-dried muck.

*By Mr. McMillan :*

Q. I see that in the exposed manure there was a loss of potash from 62 pounds to 48 pounds, but in the protected manure there was an increase from 62 pounds to 65 pounds; how do you explain that?

A. It was due perhaps to two causes; to errors of analysis and weighing, or perhaps to the fact that the fermentation of this manure had caused a certain quantity of potash, which was before unavailable (insoluble in the acid solvent) to become available, so that the acid brought it more readily into solution than before. I may be allowed to point out that a very small error in analysis when multiplied into four tons makes a considerable difference. This work was done with the greatest care, but the very circumstances of the case and nature of the material worked with prevented us obtaining absolute truth. However, the figures are put down as I obtained them, and they are such, in my opinion, as to carry conviction as to their general correctness and the conclusions that are to be drawn from them.

Q. Then your analysis could not have been correct at first because it should have shown all the potash?

A. Well, not necessarily incorrect. It is quite understandable that using the acid solvent at the strength we did (precisely the same strength as in analyses of soil)—it is quite possible that slightly more potash would be dissolved out of the rotted than out of the fresh manure. Incomplete sampling might also be a cause of this slight difference. However it may not be necessary to enter into a minute account of the factors which would affect the truth of the figure, for I feel sure that a consideration of them will be sufficient to convince you of their general correctness and of the practical lessons they teach.

We found that the loss in organic matter and nitrogen, in both manures, was more severe during the first month than subsequently. After the first three months there was but little further loss of these elements in the protected manure. In the exposed sample however, loss not only of nitrogen and organic matter but also of potash and phosphoric acid continued as long as the experiment lasted. I have already stated that there was practically no loss of potash and phosphoric acid from the protected manure. Tables will be found in my report for 1898 that trace the values of these manures month by month. The points I would at this juncture emphasize are, that there was no loss of potash and phosphoric acid and, after the first two or three months there was but little further loss of organic matter and nitrogen, from the protected sample; but when possible, as in the exposed sample, loss not only of nitrogen and organic matter but also of potash and phosphoric acid continued as long as the manure was exposed.

*By Mr. McGregor :*

Q. You say to put it on the land as soon as possible. If scattered on the ground would it not lose a great deal of strength before being ploughed in?

A. There might be loss due to several causes, under such conditions as you speak of. Loss from leaching, the floods in the spring carrying it off from the land before it could be absorbed would be the chief loss I imagine. This would occur more particularly on hill sides and poorly drained soils. I do not think, however, there is any material loss when the manure is put upon the field, spread out and ploughed under immediately. There would be a somewhat greater loss from manure in an active state of fermentation than from fresh manure, but from an experiment I made



some years ago we found the amount of such loss was very small, equal to about ten cents worth of nitrogen to the ton of manure. When you spread manure out thinly and it is at once dried by the atmosphere, fermentation is arrested and no further loss occurs. The rain that falls will dissolve much of its plant food out, but if the ground is absorbent it will not be lost. If the land is flooded, however, and much surface water is carried off, the loss in plant food of the most available kind will be considerable.

Table II gives similar information to Table I but in different form. It states the losses in percentages; thus comparing the two manures at the end of three months we find that the protected manure had lost 55 per cent of its organic matter and 17 per cent of its nitrogen, equivalent to a loss in value of 20 cents per ton; while the exposed manure during the same period had lost 60 per cent of its organic matter and 29 per cent of its nitrogen and, in addition, 8 per cent of its phosphoric acid and 22 per cent of its potash, equivalent to a loss in value of 64 cents per ton. We valued the manure at the outset at \$2.61 per ton; that is assigning to these three substances, nitrogen, phosphoric acid and potash the values which they receive in a commercial fertilizer.

Starting with manures in each case that contained plant food to the value of \$10.43, we found at the end of three months that the plant food in the protected manure was worth \$9.63 while that in the exposed manure was worth only \$7.86. In arriving at these values, it may be remarked, we have not assigned any greater values to those proportions of the phosphoric acid and potash which by fermentation had become more available. We have made it clear by this investigation that one of the beneficial effects of rotting is that certain constituents (and more especially the phosphoric acid) are rendered more available for absorption by growing crops. Were we to assign a greater value to these elements in the fermented manure than in the fresh manure, as I think we should be justified in doing, the difference I have referred to here between the values of the protected and the exposed manures would be greater than that shown by the figures just mentioned, and would be in favour of the protected manure.

I may close the consideration of this interesting subject by stating the deductions of practical value that I have been able to make from this investigation, a complete discussion of which is, as I have already said, to be found in my forthcoming report.

1. That fermentation or rotting of manure necessarily causes a greater or less loss of organic matter and nitrogen. The extent of this loss will depend upon the conditions under which the manure is rotted.

2. That the least loss of these two constituents, organic matter and nitrogen, occurred in the protected manure, the pile being kept moist and compact. The principle involved is that fermentation is controlled and to a great extent retarded by the exclusion of air.

3. That this loss of nitrogen was not altogether as is generally supposed, due to the production and volatilization of ammonia, but must in a large measure be due to the production and escape of gaseous nitrogen. It is commonly held that the loss of nitrogen from manure results, if not principally, very largely from the formation and escape of ammonia (which is a compound of nitrogen) but I have come to the conclusion from our work that there is a very large amount of nitrogen which is lost from manure in a free gaseous condition. The nitrogen which escapes in that way cannot be held or retained by gypsum or any absorbent of that kind, because the action of gypsum is to form a fixed compound with ammonia. It cannot combine with nitrogen but it will with ammonia.

4. That at no time during the rotting did we find in either manures any large or considerable amount of free ammonia, ammonium salts, nitrates or nitrites, forms of nitrogen that are more or less directly usable by crops. Rotting, however, breaks down and disintegrates the litter and coarser parts of the manure making it more uniform, and consequently allowing a more intimate mixing of the manure with the soil. It also no doubt hastens the formation of humus and available nitrogen compounds when the manure is subsequently in the soil. That is to say, it brings about the initial stage in the production of nitrates and nitrites. While there is very little

immediate available nitrogen in fresh manure, there are nitrogen compounds in rotted manure that readily furnish nitrogen to growing crops.

5. That as regards potash we could not detect any appreciable or beneficial effect upon its availability by rotting the manure. We found in round numbers 85 per cent of the potash in fresh manure to be in an available condition. We cannot look therefore for any beneficial effect upon the potash in the manure by rotting. There is in this a very important and practical lesson, namely, that we have in the fresh manure potash practically as available as in the rotted manure. It teaches the necessity of well looking after the liquid manure. The potash is contained for the most part in the liquid manure.

6. That as regards phosphoric acid, rotting under the best conditions does improve its availability. At the outset 60 per cent of the total phosphoric acid was available and at the close of the experiment the percentage available had been increased to 75 per cent. So that rotting has a beneficial effect upon the condition of phosphoric acid.

*By Mr. McMillan :*

Q. You have not tried rotting manure in the case where it is kept trapped hard and firm by the animals and kept solid as against where it is left in the shed?

A. No, we have not. But it was not allowed to be kept loose in the shed in either case. After each month's turning we were careful to make it as compact and solid as possible with ordinary means.

Q. Was there any fermentation took place after three months?

A. Yes, but the fermentation practically ceased, that is to say, as far as the evolution of the heat was concerned, about the end of three months, but up to that it kept quite warm.

Q. And didn't it increase the heat when it was turned over?

A. Yes, it did for the first two or three months, not after.

Q. In turning it over you kept it damp?

A. Yes. Of course that outside or exposed was kept more or less always damp by the rain.

Q. But inside you kept it from mould?

A. Yes. It must be kept solid and damp if we are to have the most favourable conditions. I am convinced of that.

7. There was practically no loss of phosphoric acid and potash from the protected manure?

A. Practically no loss of these elements.

8. That the exposed manure lost about one-sixth of its phosphoric acid and somewhat more than one-third of its potash by leaching, in spite of the fact that it was on a fairly well-constructed board floor. That is a very important deduction.

9. That all the benefit to be derived from rotting results from or is caused by the changes during the first two months, practically speaking, of rotting, certainly within three months. The most marked changes are effected in the first month. A longer period than this gives, in my opinion, but little additional value to the manure and may lead to further loss. After a period of three months I cannot detect any appreciable effect upon the availability of the plant food in the manure, and after that period in some particulars certain losses continue to take place.

Upon the ordinary every day farm we find no special provision for or precautions taken in the preservation or rotting of manure. I am therefore led to conclude that the loss ordinarily suffered must be much greater than that from the exposed manure in our experiments, because, as I have said, we constructed a fairly well built bin with a double boarded floor and sides, and in spite of that there was one-third lost in the value of plant food as well as a large amount of organic matter.

If it is desired to rot the manure it seems to me that a concrete bin or cellar should be used, or in default of this a thick layer of air dried muck or earth rich in organic matter placed under the manure to absorb the liquid portions. It is important that the latter should be well looked after, for it is of more value than the solid portion; it contains not only the larger proportions of nitrogen and potash,

but these are present in more available forms for plant use, than contained in the solid portion. I therefore again emphasize that it is important we should pay attention to the preservation of the liquid portion. From what I know of the prevalent practice of this country the farmers preserve and put into the ground the solid portion but take little or no pains whatever to prevent the liquid portion of the manure from running away and wasting.

As far as practicable the manure during rotting should be kept compact and moist. These conditions are frequently obtained by allowing cattle to run over the manure and tramp it.

In this statement I have only set forth the chief results of our experiments; the principles have been enunciated and it remains for the individual farmer to apply them as best he may according to his circumstances and as far as his conditions and circumstances will allow him.

*By Mr. McGregor :*

Q. Do you think it would be well to put ashes in your compost heap?

A. No, sir, not wood ashes, or indeed ashes of any kind. Wood ashes contain alkali, and that would have the effect of liberating the ammonia which would be lost.

Q. You would rather use it on the land?

A. Yes, I would use wood ashes directly upon the land, but I would not mix them with manure as that might occasion loss of nitrogen.

Q. Lime would have the same effect?

A. Yes.

Q. Nor salt, you would not use that?

A. I see no object in using salt in that way. It would not have the same effect as I have named, but I fancy it would tend to leaching. Salt has not the power to fix escaping ammonia.

Q. Would it make the compost heap of manure more valuable?

A. No, I do not think it would have any effect in that regard either one way or the other. Muriate of potash has, however, been recommended for that purpose, but I don't generally advise it.

Q. These are the losses I see there?

A. Yes, on that table (Table No. 2) are given the losses in percentage of the amounts originally present.

Q. The losses at 3, 6 and 9 months.

A. In table No. 1 the weights of the various elements of fertility are given at the end of 3, 6, 9 and 12 months. From these data the losses in percentage (given in table 2) have been calculated.

*By Mr. Erb :*

Q. Before leaving this question of manures, have you ever conducted any experiments to show what loss, if any, takes place in fresh manure kept compact and preventing fermentation?

A. No, we have not, chiefly because I do not believe it would be possible or at any rate practicable to preserve manure in such a condition. I do not think you could totally arrest fermentation without the use of some preventive such as formalin.

Q. Generally speaking, a great many farmers allow their cattle to run over the barnyard and they keep the manure compact and solid?

A. I am afraid the majority of farmers do not take pains to keep the manure compact and protected from washing rains though, of course, there are some that do.

*By Mr. McGregor :*

Q. In barnyards where there is plenty of straw and the manure is kept in the cellar, what my friend says is the larger portion of that manure is thoroughly tramped and solid, and is not taken out until June or July and is then put upon the



ground, and in that case it is not mildewed or moulded in any way, and that is the way in which we use it?

A. Such manure would be very rich, because the conditions named would be such as to prevent both excessive fermentation as well as leaching.

Q. You don't think there is any loss from leaching of the liquid manure in such a case?

A. There might be and there might not be. If the floor were water-tight and plenty of bedding used, there would be but little loss from leaching. The losses occur from two causes—fermentation and leaching; the loss of soluble matter by leaching is frequently the most serious. If you can prevent fermentation on the one hand and leaching on the other, you save all the fertilizing constituents of your manure.

*By Mr. McMillan:*

Q. I have seen a stable constructed so that the mangers at which the animals fed were so arranged that could be raised as the manure rose in the stalls. That building was deep enough to allow it to lie there till spring, and there was no fermentation?

A. There would be some fermentation, but, I believe, under such circumstances, the loss would be exceedingly small compared with that in manure loosely kept in the barnyard.

We know that manure is full of minute living organisms, and that liquid manure is a peculiarly unstable material; it is not surprising, therefore, that these organisms, which live upon the organic matter of the manure, should destroy the more soluble part of the manure (urine), provided conditions are favourable. Fermentation is the effect or result of these organisms living in the manure.

*By Mr. Featherston:*

Q. Your experiment on fermentation shows a loss along the line of that manure from the first?

A. You speak in regard to the exposed manure?

Q. All?

A. I say in certain elements. I must make a guarded answer, because I have pointed out that in the protected manure the losses were in organic matter and nitrogen and that there were none in phosphoric acid or potash but on the other hand there were losses in potash, phosphoric acid, nitrogen and organic matter in the exposed lot of manure. The extent of the losses will be regulated by the condition under which the rotting takes place.

Q. But can't you do better by using fresh manure at once upon the land rather than rotted?

A. That may be true for most soils but yet for certain soils and crops I think, there are advantages which make it advisable at times to use rotted manure rather than fresh manure. For instance I think that on light soils, it is often preferable. Also for crops which have only a short season of growth and which require their plant food to be supplied to them in a more or less immediately available condition; such is furnished them by rotted manure rather than fresh manure. The relative merits of fresh and rotted manure is a large question, which I shall be willing to take up, but I feel it should be answered fully if at all, as otherwise it might be misunderstood. We have to take into consideration not only the manure but the soil and the crop. My only endeavour to-day has been to show the nature of the changes which take place under various conditions of rotting. I will say this however, that if a farmer has not the means to carefully preserve his manure it would better to get into the soil as soon as possible. If his land is heavy, one in which clay predominates, and the matter of labour did not prevent him, it would be most economical to get the manure into the soil as soon as it is made. For light soils, producing crops with a short season of growth, partially rotted manure would in all probability be better. Corn and roots might be termed crops of a long season of growth, the cereals those with a short season of growth.

Q. In the event of seeding clover with grain you would be giving the benefit of the manurial content of the clover crop to the soil.

A. Yes.

*By Mr. Rogers :*

Q. Rotting manure is of benefit in killing bad weeds ?

A. Yes, that is one of the advantages, but unless the rotting is thorough, some of the weed seeds will escape destruction.

Q. Manure supplies a good deal of humus ?

A. Yes. I place great importance on humus. The more I look into the question of virgin soils, the more I find that their fertility is closely associated with the amount of humus present. The fertility of a soil depends largely upon the amount of humus in it. Where there is humus there I find nitrogen; and, usually, where I find humus, there I find the right physical and mechanical conditions of the soil, conditions that, in times of drought, will bring a full, good crop to harvest.

*By Mr. McGregor :*

Q. You say that ashes are good in the compost heap; would it not be good on the soil ?

A. Wood ashes are a very excellent source of potash. You can apply fifty to eighty bushels to the acre. I do not know a more economical way of supplying potash and also phosphoric acid to the soil. They contain about two per cent of phosphoric acid and five to six per cent potash. They make an excellent compost with swamp muck.

*By Mr. Erb :*

Q. One point is not clear to me. Your table shows that a loss in fertilizing elements took place in the exposed manure that was rotted. Have you any table to show the effect on exposed manure not rotted, because that is the common way of keeping manure in our district ?

A. No, I have no data of my own, but there would be a loss in liquid manure and also by the rain washing through the manure.

Q. Not necessarily, if you use lots of straw.

A. You suppose conditions under which it would be exposed to rain ?

Q. Yes.

A. Well, we understand that if liquid manure has a chance it will drain away and be lost.

Q. With us, all the manure which accumulates is left till a few weeks ago.

A. The loss would be in a large measure proportionate to the rain fall and the lay of the land.

Q. Well, you have no experiments to show the loss in that way, because this is a common practise.

A. No.

*By Mr. Gilmour :*

Q. How often did you weigh it; every time you turned it ?

A. Yes.

Q. That is something we do not have; that manure is changed very often, it is an extraordinary shrinkage in three months, from 8,000 pounds to 2,980.

A. The work was very carefully done, sir, and I can personally vouch for the weights.

*By Mr. McMillan :*

I will say this, as far as taking manure from the stable to the fields, we have practiced it for years. When we began we took a certain amount of manure rotted in the shed and also some from the heap and we found the same amount of good

from both. Besides there was the amount of saving of labour by not having to cart it twice; that is when your land is well drained and not too hilly.

THE CHAIRMAN.—You don't find your manure, where the cattle are on it all the time, fermented, do you?

MR. McMILLAN.—No, but when cattle are on it all the time we take it right from the cattle to the field?

*By Mr. McGregor :*

Q. You advise that in every case possible the straw should be cut?

A. Yes. It increases the absorbent quality.

THE CHAIRMAN.—I think there is one thing we should all remember, and that is that these experiments were carried on with a view of showing the changes that take place in the manure pile and in manure that is under cover.

MR. SHUTT.—We have already considered instituting experiments which would include putting manure on the field in a heap and allowing it to remain there untouched until the end of the rotting period. I am afraid, however, there are difficulties in such an experiment that we shall not be able to overcome. Where we can control or measure the conditions we can make an experiment successfully, but where we cannot control conditions the results will not be so definite.

*By Mr. McGregor :*

Q. Where the experiments are carried on I claim there is more good if the conditions are such as we actually find and are not supposititious ones?

A. The conditions are different on every farm. There is no uniform method or practice throughout the country as far as I am aware. It is a somewhat mistaken idea to suppose that no fermentation ensues under such conditions as have been mentioned. In the barnyard, unless the manure is in a very thin layer, I am of opinion that considerable fermentation takes place.

*By Mr. McMillan :*

Q. In the barnyard?

A. Yes.

Q. We don't keep any in the open barnyard at all.

*By Mr. Erb :*

Q. That it does not ferment is proved I think by the fact that when you come to move the manure in the spring you sometimes find snow and ice under it.

A. I scarcely think that is sufficient proof, though of course fermentation is much retarded during the winter months.

#### THE USE OF NITROGEN FOR ENCOURAGING THE GROWTH OF CLOVER.

For some years past, as you are doubtless aware, we have been advocating the more extensive growth of the legumes, clover, beans, peas, etc., and particularly clover, as a means not only of furnishing a rich fodder but also of improving the land by adding to its store of humus and nitrogen.

I shall not refer again in detail to the great importance I place upon humus as a soil constituent nor to the fact that the greater part of the nitrogen supplied to a soil when ploughing under clover (or even the clover roots) is a distinct addition to the soil's fertility, since the clover plant obtains the greater part of its nitrogen from the free nitrogen of the air, a source, as we know that is not utilizable by other farm crops.

In previous years I have explained the underlying principles which are involved in the absorption or assimilation of atmospheric nitrogen by clover. I have also stated the reasons why I consider clover one of the cheapest and best means for improving the condition of our soil. As a soil enricher we have shown both by



trials in the field as well as by careful analysis in the laboratory that clover is a fertilizer at once cheap and effective. If we supply the clover with a sufficiency of potash, phosphoric acid and lime, together with a fair condition of the soil, it will by the agency of certain microbes in the soil obtain its own nitrogen from the atmosphere. By furnishing potash and phosphoric acid and growing clover there will be little need to purchase for our soils nitrogen, the most expensive of all the elements of plant food. Moreover the organic matter of the decaying roots and foliage of the clover furnishes humus, mellowing the soil and making it more retentive of moisture and plant food, less subject to sudden changes of temperature and a more comfortable home for the myriads of microscopic organisms which during their life convert inert soil elements into food for growing crops.

It is only been during recent years that investigations have shown that the conversion of the inert plant food of the soil into available forms is due largely to the activity of these micro-organisms which exist in myriads in our soils. We now understand why and how the legumes, clover, peas, beans, etc., become enrichers rather than impoverishers of the soil in nitrogen. This latter is due to the activity of certain bacteria that reside in nodules that are found on the roots and rootlets of the legumes. They, in some way which we do not at present altogether understand, enable the clover to appropriate the free nitrogen of the air. These bacteria, I repeat, appropriate and absorb the free nitrogen of the air which is present between the particles of soil and passing it on to the host plant, the clover, the nitrogen is there converted into the tissues of root and stem and leaf. Without the aid of these bacteria, clover, like all other farm crops, can only use soil nitrogen. In other words without the assistance of these bacteria, the legumes can only take their nitrogen from soil in the form of nitrates in the same way as other farm crops.

#### NITRAGIN AS A FERTILIZER FOR LEGUMINOUS PLANTS.

With the aid of these bacteria, clover adds to the soil stores of nitrogen, not without them. Many soils contain these bacteria in sufficient numbers, but nevertheless there are soils that appear to be practically destitute of them. Last year I informed this committee that a preparation of these clover bacteria was being made and sold in Germany, and that we had used this preparation, known as nitragin, with good effect, increasing thereby the crop very considerably. I think last year I brought a bottle of this preparation (nitragin) to this committee and said that there were about seventeen apparently distinct nitragins made in Germany, each one being intended for a special member of the legume family. We have experimented with three, for clover, pease and horse beans.

*By Mr. McMillan :*

Q. Would it not be too costly for this use ?

A. The bottle which I showed last year contained sufficient when diluted for half an acre; it cost laid down here between 70 and 80 cents. There are two plans of using it, one the inoculation of the seed and the other the inoculation of the land. In my evidence of last year the details of these methods were given. We have been using this material under both methods for the last two or three years to ascertain its effect upon the crop of clover. During 1898 the third year's experiments were made, and the results corroborate those hitherto obtained, namely, that treatment of the seed with nitragin caused a marked increase in the weight of crops produced.

I shall only cite one of the experiments which I tried last year and which is still in force, giving you the data of last year's results and exhibiting a photograph which I took yesterday. These show most markedly the difference between the growth of the treated and untreated crops this year. For this experiment we selected a small area of practically pure sand. This soil—if it can be so called, because it was practically destitute of humus and nitrogen—we furnished with phosphoric acid and potash, supplied at the rate of superphosphate, 360 pounds

per acre and muriate of potash 120 pounds to the acre. This application was made with the view of furnishing the clover with the mineral constituents which it required. Supplied with these, the clover, with the aid of the bacteria, was to get its own nitrogen. Upon this plot were then sown two rows some eight inches apart of clover seed that had been soaked in nitragin and, at a distance of two feet from these, two rows of untreated seed were sown. The crop from the inoculated seed was much more luxuriant than that of the untreated seed. In October, the plants in four running feet in each row were carefully taken up, the roots washed and the whole plants weighed. We found that the weight of the plants from the untreated seed was 16 ounces, and those from the inoculated seeds weighed  $18\frac{1}{2}$  ounces. This represents a gain of about 15 per cent which we must suppose was due to the fact of the inoculation of the seed and the beneficial action of the nitragin.

*By Mr. Erb:*

Q. Did you sprinkle or water that plot or trust to the natural rain fall?

A. I watered it at first; it is situated on a slope and I watered it when necessary, treating both sets of plants alike.

The remaining portions of the rows were left undug. The plants in both series survived the winter and the day before yesterday I photographed them *in situ*. On the left hand of the photograph you see the clover from the inoculated seed, on the right, the clover from the untreated seed. Nothing could give you a better idea of the great luxuriance of the growth from the inoculated seed as compared with that of the untreated seed. (*Vide plate 1.*) The results are truly remarkable. In a few weeks from the present date the plants in both series will be taken up, weighed and analysed.

It is scarcely possible to exaggerate the importance to agriculture of this modern achievement of science, and it will be to the interest of every farmer to inform himself how clover can be made to improve his soil, and how the growth of clover can be encouraged. All who can should seize this opportunity of seeing this experiment at the Central Farm. The results are of a most convincing nature.

*By Mr. McMillan:*

Q. But it will be necessary in all such cases that the land should be well under-drained, so that it will be in a proper state of cultivation?—A. You are referring now to the leaching of manure and loss on undrained land, I presume?

Q. No, not so much to that as to the preservation of bacteria which go into the nodules, as they cannot work with the nodules in water?—A. Yes, drainage is important, especially if the soil is of a heavy nature. It is impossible to get a good crop of clover on land which is water soaked, that is, upon which and in which the water lies without draining away readily. From the results of this experiment I judge that with the use of nitragin a good crop of clover can be obtained on the poorest soil, provided phosphoric acid and potash are supplied. Of course moisture is necessary, one must have a favourable season, but I think we are justified in supposing that by providing the necessary mineral constituents, phosphoric acid and potash, as we have in this case, clover will thrive and finally turn out well on exceedingly light and sandy soils.

Q. What will be the cost per acre of treating the seed?

A. About \$1.50.

*By Mr. McGregor:*

Q. Can it be bought readily?

A. It cannot as yet be bought readily in this country. There are one or two difficulties in the way of its coming into general use at present. One is that it has to be used while still freshly made; it won't keep for any length of time. The manufacturers will not guarantee its fertility or rather vitality after some six

weeks. Another point is that it must not be exposed to the light, *i. e.* to strong sunlight, or to a temperature above that of the human body, about 100° Fah. If the temperature is above 100 it very much diminishes the activity of the germ.

Q. It could be made here, I suppose?

A. It could be made here. Any farmer, to a certain extent, without making it could obtain the same results by taking soil from a field that has grown a good crop of clover and sowing it over the poorer field. By such means he would inoculate the poorer soil with clover germs and obtain a good crop of clover as the result. The earth which comes from about the roots of the clover contains the germs and would serve to inoculate the poorer soil. Another plan would be to pour cold water over the earth (previously placed in a barrel) containing these germs and after allowing the soil to settle to pour off the supernatant water and soak in it the seed about to be sown.

*By Mr. Rogers:*

Q. A change of soil instead of a change of seed?

A. Having indicated the nature of our work in this matter, it will only be necessary for me to draw your attention to the following table which gives the amount of crop (both foliage and roots) and amount of nitrogen therein contained, in the chief experiments since 1894. It gives us information as to the weight of nitrogen we can supply to a soil per acre (1) by ploughing under the whole crop or (2) simply by allowing the roots of the clover to decay, feeding off the clover. I think we may safely say that 75 to 100 lbs. of nitrogen can be furnished per acre simply by sowing eight to ten lbs. of clover seed. This, it appears to me, is the cheapest source of nitrogen known.

In this connection it is important to remember that eight pounds of clover seed can be sown with the grain (oats or barley) without diminishing the yield of the latter, at least, so we have found on the Experimental Farm.

#### CLOVER AND GREEN MANURES.

A. Mammoth Red. B. Common Red.

Numbers.	Kind.	Sown.	Collected.	WEIGHT OF MATERIAL (Fresh) PER ACRE.						NITROGEN, PER ACRE.		
				Stems and Leaves.		Roots.		Total.		Stems and Leaves.	Roots.	Total.
				Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Lbs.	Lbs.	Lbs.
1	A	April '94..	May '95..	10	70	5	1,476	15	1,546	101	49	150
2	A	" '93..	" '95..	5	1,235	9	535	14	1,770	52	61	111
3	A	July '96..	Oct. '96..	6	1,310	3	1,260	10	570	82	48	130
4	B	" '96..	" '96..	4	1,779	2	1,445	7	1,224	70	47	117
5	A	May '96..	May '97..	.....	.....	.....	.....	2	1,995	.....	.....	81
6	B	" '96..	" '97..	.....	.....	.....	.....	3	125	.....	.....	62
7	A	" '97..	Oct. '97..	4	508	2	1,785	7	293	*62	*35	*97
8	B	" '97..	" '97..	5	209	3	296	8	505	*76	*54	*130

Nos. 1 and 2, roots taken to a depth of four feet. Good spring growth when collected.

Nos. 3 and 4, sown as cover crop in orchard. Roots taken to a depth of two feet.

Nos. 5 and 6, dead stems, leaves and roots. Winter-killed.

\*Nos. 7 and 8, nitrogen estimated.



## CANADIAN AND HUNGARIAN FLOURS.

In view of the present increased demand in England for hard wheats to mix with the home grown and softer wheats, it may be of interest if I bring before you the results of a comparative examination between Canadian best patents and the best grades of Hungarian flours, made a few months ago in our laboratories.

All our data point to the superiority of the Canadian flour for bread-making purposes; the percentages of albuminoids or protein—the most important part from a nutritive standpoint—are as follows:—

Canadian, best patents .....	12.59 per cent.
Hungarian, best grade .....	11.27 “

*By Mr. McGregor :*

Q. It makes a good deal of difference where you get that wheat from at first?

A. Undoubtedly. I am now comparing the best grades of Canadian and Hungarian flour. The analyses were made at the direction of the hon. Minister of Agriculture, who himself obtained the samples. It is, I believe, a comparison of the best grade flour from Canadian North-western wheat with what we may suppose to be the best grade Hungarian flour.

Q. That would be wheat from west of Winnipeg?

A. It was.

The determination of gluten, both wet and dry, is also in favour of Canadian flour, as follows:—

	Wet Gluten.	Dry Gluten.
Canadian, best patents .....	34.22	12.33
Hungarian, best grade .....	26.17	9.79

From these figures I conclude that, weight for weight, Canadian flour would yield more bread than the Hungarian flour. I dare say you are sufficiently conversant with the manner in which this determination is made, and its value, to understand the great superiority which the above data give to the Canadian flour.

Q. It depends to some extent upon what land this wheat was taken off. If you take land that has been used a long time, it means that the wheat will have more starch and less gluten?

A. We have not any data on record to show that the poorer land makes a wheat which is richer in starch and poorer in gluten; the variety of wheat and the climatic conditions generally undoubtedly are the factors that affect the percentage of gluten. Climatic and seasonal influences are most potent in their effect upon wheat.

*By Mr. Semple :*

Q. Have you made any comparison with fall wheat compared with the others?

A. We have not. But we are commencing, or rather we have commenced, a very extensive series of experiments to arrive at the relative values of certain of our Canadian wheats, as grown more particularly in the North-west. The work is not sufficiently far advanced at present for me to give any information. Fall wheats, as a class, contain less gluten, than spring wheat.

*By Mr. McGregor :*

Q. In the North-west they take out more bread to the pound than with the eastern flour?

A. Yes. The wet gluten was 34 per cent in the Canadian North-western flour, as against 26 per cent in the Hungarian. These data make the former more absorbent and more valuable for bread making. In respect to those qualities of gluten which are valuable in bread making, elasticity and firmness, the gluten from the Canadian flour was the more marked of the two.

*By Mr. Erb :*

Q. Is this Hungarian flour made from wheat grown in Hungary ?

A. Yes. The flour was made in Hungary.

Q. Is there much export from there to Britain ?

A. I cannot tell you as to quantity, but I know it is largely used in Great Britain for mixing with soft home grown flours.

*By Mr. Featherston :*

Q. Our wheat is better ?

A. Yes, flour from Red Fife wheat grown in our North-west is richer in gluten and will make more bread, weight for weight.

#### FODDERS AND FEEDING STUFFS.

It is now my wish to bring to your attention some facts about fodders and feeding stuffs. First, in connection with the native grasses of Manitoba and the North-west Territories. During the season of 1898 we procured through the superintendents of the experimental farms of Manitoba and the North-west Territories samples of many native grasses, growing both upon uplands and sloughs, in order to ascertain their relative feeding value. We deemed this investigation of considerable importance, as frequently the native grasses must be depended upon as the chief supply of cattle food. The native hay cut from the uplands proved to consist of a mixture of grasses, comprising at least half a dozen species, together with various weeds, such as artimesia, Canada thistle, stink weed, heliopsis, wild rose, &c. The hay cut from the lowlands and sloughs consisted largely, sometimes wholly, of sedges. These sedges are characterized—they are not true grasses—by having a solid triangular stems and very rough-margined leaves. Sedges are usually considered as decidedly inferior to grasses as regards palatability and digestibility, though we have the testimony of many reliable and practical men in the North-west that animals not only eat such sedge hay with avidity, but keep in good condition throughout the winter. Our analyses go to show that in many particulars this native hay compares favourably with that of many cultivated grasses. We should probably find that the sedges, like grasses, deteriorate in feeding value as they ripen, and that the most nutritious, digestible and palatable hay is that from sedges which have been cut before reaching maturity. We find many of these sedges contain a large amount of nutriment, but not quite as good as native grasses. No doubt as a coarse fodder for cattle they are of value, especially when cut early.

*By Mr. Rogers :*

Q. I thought they were considered more nutritious than our cultivated grasses ?

A. No, I should not like to say that sedge hay was equal to hay from the cultivated grasses.

*By the Chairman :*

Q. It grows in the sloughs ?

A. And on low lands as well as the sloughs.

#### BROME GRASS.

In regard to Brome grass, a comparatively speaking newly introduced grass—the importance of which, both for meadow and pasture, has been brought before you on several occasions—we made last year a comparative study of its hay with that of Timothy, both having been grown in the same season on the Central Experimental Farm. This was done to make more complete our data respecting nutritive qualities of this grass. The analyses showed that the Brome grass from a feeding

standpoint was somewhat the better of the two. I need not give the data in detail, as they will appear in my annual report, but will state that the albuminoids, the most important constituent of fodder, stand thus: Timothy hay 118·8 pounds per ton, and Brome grass hay 132·2 pounds per ton, showing that the Brome grass hay is somewhat the richer of the two.

#### SOJA BEANS.

In the matter of Soja beans we have made a series of analyses of this fodder plant grown under varying conditions. In common with other legumes it was found to be rich in albuminoids, though in this respect not quite the equal of many other members of this family. The chief object in growing this plant was to obtain a fodder to put in the silo with corn. We have been using horse beans for siloing with corn for some years, but we find that the horse beans will not withstand drought. Unfortunately the Soja beans become hard and woody in the stalk before the corn is ready for the silo. It seems doubtful whether they will be largely grown for silo purposes for this reason. They fairly well withstand heat and drought, but the difficulty is that as the autumn advances the stems get very woody and fibrous.

#### OAT FEEDS.

We have made some inquiry into the feeding values of certain oat feeds,—milling by-products. In the manufacture of oat meal and the preparation of breakfast foods there result many by-products of the oat. These find a ready sale among farmers and dairymen under various names—oat dust, oat feed, oat shorts, &c., and differ greatly in feeding value, according to the part of the grain which predominates and the presence or absence of mill sweepings. The greater the proportion of oat hulls the less will be the feeding value. The so-called oat dust, consisting chiefly of the hairs of the kernel, is also poor in nutritive qualities. Oat feed or oat shorts, however, may contain but a small proportion of these materials. Feeds under this name are usually prepared, or largely so, from the crushed broken and small grain and the shorts and bran of the oat form a valuable feeding stuff. Our analytical results make it apparent that a careful discrimination is necessary on the part of the purchaser. Only those having a clean, bright appearance and are heavy, close and fine can be considered as comparable in feeding value to our ordinary milling products. I bring this matter before you because I think it is wise to speak a word of warning to farmers and dairymen not to buy without first making a somewhat careful scrutiny of these feeds. It is not necessary to have an analysis in each case to form an opinion, but those which consist largely of the hairs of the kernel we must understand do not contain much digestible food material. There are, say, two per cent of digestible albuminoids in oat hulls where there would be 12 per cent in meal prepared from small and broken grain. The several samples which I have brought here this morning illustrate this point. I have here, for instance, one sample containing 17 per cent of protein, and here another containing 11·0 per cent. The first is worth half as much more as the second. Again, in this sample of oat dust there is contained a very small percentage of albuminoids; it cannot be regarded as a concentrated feed at all.

*By Mr. McGregor :*

Q. When feed is so cheap it does not pay to bother with them?—A. No, unfortunately, though, some people have taken a fancy to these foods and are feeding them very largely without using any discretion as to their quality.

*By Mr. Rogers :*

Q. It would be an incentive to grow heavy oats?—A. These are by-products in the manufacture of oatmeal. The hulls and hairs of the kernel are very poor and indigestible food.



By Mr. Featherston :

Q. Can you give an analysis of the different feeds as to their digestible matter ?  
—A. Professor Henry, of Wisconsin, states their digestible nutrients, as follows :—

Name of Feed.	Dry Matter in 100 Lbs.	Digestible Nutrients in 100 Lbs.		
		Protein.	Carbo-hydrates.	Fat (Ether Extract).
	Lbs.	Lbs.	Lbs.	Lbs.
Oats.....	89·0	9·2	47·3	4·2
Oatmeal.....	92·1	11·5	52·1	5·9
Oat feed or Shorts. ....	92·3	12·5	46·9	2·8
Oat dust.....	93·5	8·9	38·4	5·1
Oat hulls.....	90·6	1·3	40·1	·6

#### MOLASSES REFUSE FROM REFINING.

A product of the nature of molasses is obtained in the refining of sugar (especially that made from beets) from which the further extraction of crystalized sugar is unprofitable owing to the presence of certain saline and nitrogenous, (albuminous) materials. This molasses has been used on the European continent with good results either *per se* or mixed with various meals and used as a cake. In view of certain inquiries from correspondents who had been using this molasses in the maritime provinces and also from the fact that a company is being formed in Montreal to manufacture a cake from it using cornmeal and bran (intending to sell it to cattle exporters for use on ship board), we submitted to analysis two samples forwarded from Halifax. We found that this material would make a very valuable feed stuff, for it practically contained fifty per cent of sugar, the most assimilable of all the carbo-hydrates found in cattle feeds. Though not destitute of nitrogenous matter its use would have to be supplemented with a due proportion of some meal or concentrated mill product to make a balanced ration as well. A certain amount of coarse fodder also would be necessary. The function of sugar in the animal economy is as a source of energy, to maintain the vital heat and for the production of fat. Being soluble it enters at once the circulatory system and can be utilized. Animals take to this refuse readily and evince a great liking for it. No doubt it stimulates the appetite and probably increases the digestibility of the other constituents of the ration. This crude molasses contains about nine per cent of mineral matter about one half of which is potash. This element is a valuable plant food, and as it is eliminated by the animals through the kidneys, it behooves the farmer using this material to look well after the liquid manure.

By Mr. McGregor :

Q. Did you ever try sorghum ? the product of sorghum ?

A. No, sir.

Q. They grow a lot of it with us and make molasses from it and I was wondering if you had tried it for feeding.

A. No, sir.

## THE PRESERVATION OF EGGS.

We have recently conducted a series of experiments in connection with preservatives for eggs. You will doubtless have noticed an account of "water glass" or silicate of soda as a preservative for eggs, going the rounds of the press for the past year. To ascertain its efficacy for this purpose as compared with ordinary lime water, Mr. Gilbert and I commenced a series of experiments last October, testing the eggs in March of the present year.

After six months' trial we failed to see that there was any additional benefit due to the water glass over the ordinary lime water, in other words, that the lime water and the solution of "water glass" were equally efficacious. Since the water glass is a caustic fluid and consequently more disagreeable to use than lime water there was nothing to recommend the former in preference to the latter. In both cases all the eggs were good, using the term according to its usual acceptation. We found on poaching the eggs (we think that is the best way to test them) that in all a peculiar flavour had been developed which I can only designate as slightly stale or musty. We came to the opinion that no preservative, at present known, will prevent the loss of that flavour which characterizes the fresh egg. However, we are continuing this work, and we have hope of greater success than in the past, more particularly with certain solutions containing glycerine.

*By Mr. McMillan :*

Q. I have seen an egg put in the pickle in March and taken out in September and you could not distinguish any smell and you could not detect any flavour.

A. Was that in lime water.

Q. I cannot say what it was. It was in Mr. G. D. Wilson's institution.

A. We used a number of solutions of various strengths. All the treated eggs looked beautifully fresh and even when broken it was exceedingly difficult to notice any difference compared with a fresh egg. Unless the eggs were submerged, a slight shrinkage of the contents had occurred. In those submerged in the lime water and water glass solutions, the air space, however, was not larger than in the fresh egg, showing little or no shrinkage. In the poached eggs from both preservatives we detected that slightly musty or stale flavour that I have spoken of.

*By Mr. Rogers :*

Q. In poaching did the egg flatten or rise up ?

A. It flattened more than the fresh egg.

*By Mr. McMillan :*

Q. Would those eggs boil without cracking ?

A. Some did but some did not. Those continuously kept in the lime water and the water glass for the most part did crack. All the eggs were strictly fresh when we started the experiment. This is an essential point. Another essential is that the eggs shall be completely submerged in the preservative liquid. A shrinkage of the contents in those not kept submerged occurred. As far as our experiment went, we believe the best way was to keep them in lime water all the time.

*By Mr. Erb :*

Q. Will the eggs sink of their own weight in that liquid—water glass ?

A. Yes, sir, eggs sink in a ten per cent solution. That is the strength we used. The following statement gives our results concisely.

## EXPERIMENTS WITH EGG PRESERVATIVES.

The liquids employed were (1) a saturated solution of lime-water, and, (2) a ten per cent solution of "water glass" (Sodium silicate).

The eggs were treated during the first week of October, 1898, and tested 22nd March, 1899. Those eggs which were not kept throughout this term in either of the preservatives, together with the untreated eggs, were placed in a rack within a drawer in the laboratory. The eggs in the solutions were also in the laboratory, and consequently all were at a temperature of about 70 degrees F. throughout the winter. The examination consisted of noting the appearance on breaking and the colour, odour, taste, &c., after poaching.

#### TREATMENT AND RESULTS.

*No. 1. Untreated.*—The yolk was stuck to the side of the shell and was much shrunken, having lost its globular form;

The "white" had taken on a slightly yellow tint, which was more pronounced on boiling.

The "air space" was very large, occupying about one-third of the shell, showing shrinkage from evaporation.

There were no signs of decay and the eggs might be pronounced as free from odour and apparently good.

On boiling, a faint "stale" odour and taste was developed.

*No. 2. Kept under lime-water 2 days* and then put in rack in drawer:

The yolk was not stuck to the shell and was more globular than in the untreated, though not so globular as that in a fresh egg.

The "white" was similar to that in the untreated.

The "air space" was only about one-half the size of that in the untreated, showing less shrinkage.

Apparently quite good, but developing a slight "stale" odour and flavour on boiling.

*No. 3.—Kept under lime-water 7 days* and then placed in rack:

Apparently quite good; somewhat less shrinkage, perhaps, of the yolk than in No. 2, but in all other particulars giving practically the same results.

*No. 4.—Kept in lime-water continuously* throughout period of testing:

Apparently quite good, but the "white", as before, turning slightly yellow and a faint stale odour developing on boiling.

Yolk almost, or quite, globular; "air space" no larger than in fresh egg.

*No. 5.—Kept in silicate of soda 24 hours* and then placed in rack:

Apparently quite good; the "white" had taken on a faint yellow tinge. Yolk, slightly stuck to shell and shrunken; "air space", larger than in Nos. 2 and 3.

On boiling, the "white" became slightly yellower and the "stale" odour before mentioned was developed.

*No. 6.—Kept in silicate of soda 3 days* and then placed in rack:

Apparently good, but yolk slightly stuck to shell; In all respects very similar to No. 5.

*No. 7.—Kept in silicate of soda 7 days* and then placed in rack:

Apparently good, but yolk stuck to shell; "air space" somewhat similar to Nos. 5 and 6.

On boiling, was similar to Nos. 5 and 6 as to colour and odour. Shell did not break on boiling.

*No. 8.—Kept in silicate of soda continuously* throughout testing period:

Apparently quite good and no shrinkage; "air space" not larger than in fresh eggs. Yolk, globular.

On boiling, the "white", as before, assumed a faint yellowish tinge and the egg had a slight "stale" or musty flavour. Shell broke on boiling, but not so as to allow contents to escape.



## CONCLUSIONS.

1. In no instance, either of treated or untreated eggs, were any "bad" eggs found.

2. In all cases where the eggs were not kept covered throughout the period of the test with the preservative solution, shrinkage of the contents had taken place, as shown by the larger air space, the less globular form of the yolk, and in many instances by the adherence of the yolk to the shell. The eggs treated for seven days and less with lime-water showed somewhat less shrinkage than those treated a similar length of time with silicate of soda.

3. It would appear that lime-water and "water glass" used continuously, are equally efficacious in preventing shrinkage. They may also be said to give practically the same results as regards both external and internal appearance, flavour, &c., of the eggs preserved. Since water glass (silicate of soda) is more costly and more disagreeable to use than lime-water, we could not, from the present results, recommend the former as the better preservative.

4. The albumen or "white" in all the preserved eggs was very faintly yellow (though not to the same degree in all eggs), the tint becoming deeper on boiling.

5. No offensive odour was to be perceived from any of the eggs when broken, but in all instances a faint but peculiar musty or stale odour and flavour developed on poaching.

6. It is probable that no preservative will prevent the loss of flavour possessed by the fresh egg, but those which wholly exclude the air (and thus at the same time prevent shrinkage from evaporation) will be the most successful. Continuous submergence is evidently better than treatment for a few days.

It is, of course, essential that eggs to be preserved should be perfectly fresh when treated.

The experiments are being continued, and further results will be issued as obtained.

## AN INVESTIGATION INTO THE CAUSE OF SOFT PORK.

Another branch of our original research was an enquiry into the cause of soft pork. I do not think it is necessary for me to dwell upon the importance of this work, because, as you are doubtless aware, there is a very large quantity of this very undesirable product at the pork packing establishments to-day. It is a low priced material and it does not pay to export it. My "preliminary report" to the Honourable Minister of Agriculture on this subject containing work done in the laboratory since February of the present year is as follows:—

## COMPOSITION AND PROPERTIES OF THE FAT IN "FIRM" AND "SOFT" PORK.

It has become a matter of great importance to Canadian farmers and those directly interested in the bacon export trade, to learn the cause or causes which produce 'soft' or 'tender' pork, since such pork sells at a much lower price than 'firm' pork, both in the home and the English markets. With the view of furnishing useful information to pork producers, and, if possible, of solving this admittedly difficult problem, the chemical composition and physical character of the fat in these two classes of pork have been studied, it being considered that the results of such an examination would form a valuable basis or standard for reference in making further experiments. These latter would consist chiefly of feeding tests under various conditions (age, breed, exercise, etc.), and the analysis, chemical and physical, of the resulting pork.

On 1st February we received from The Wm. Davies Co., Limited., Toronto, two Wiltshire sides; the one marked 'firm,' and reported on as of excellent quality; the other marked 'soft,' and stated as of very inferior quality. The former weighed forty-six pounds and a half; the latter, forty-four pounds.

Both were frozen when received, but, nevertheless, there was a most marked difference in the relative hardness of the two sides. As the sides thawed (at the

temperature of the laboratory, about 70° F.) this difference, which was ascertained or measured by the resistance of the fatty portions to pressure by the fingers, became still more pronounced. This was further evidenced (February 2nd), by raising the ham by lifting as the sides lay on the table; the 'firm' remained fairly straight; whereas, the 'soft' doubled over. The relative softness is also shown in the accompanying photographs, taken 2nd February, at 3 p.m., and 3rd February, at 10 a.m. They illustrate the amount of 'drag' caused by the weight of the sides similarly suspended by hooks. The extent of the 'drag' in the 'soft' side is much the greater.

The samples of the fat for examination were obtained by : (1) first cutting the sides (a) immediately in front of the thigh joint (socket of the femur in the pelvic arch), and (b) immediately in front of the first rib, and then taking the fatty tissue at each of these sections. Those taken at (a) are designated in the following tables as "Ham", those at (b) as "Shoulder" (see photo). The precaution of confining the place or area from which the fat was taken was made necessary from the fact that certain authorities stated that the fat varied considerably in composition, etc., according to its position in the animal. Care was exercised in the preparation of the sample for analysis, to dissect out and reject all muscular tissue, blood vessels, etc.

Though the "Soft" side was somewhat the lighter of the two, its proportion of adipose tissue (fat) to muscle (lean) was the greater (*vide Plate II*).

In determining the composition of the fat of the two sides, the following estimations were made: water, nitrogen (from which the amount of tissue-other-than-fat was calculated), fat (which was obtained by difference) and the amounts of olein and palmitin and stearin. The amount of salt present was also determined. Table I sets forth the results obtained :—

TABLE I.

COMPOSITION OF FATTY TISSUE IN "FIRM" AND "SOFT" BACON.

Constituent.	FIRM.		SOFT.	
	Ham.	Shoulder.	Ham.	Shoulder.
	p. c.	p. c.	p. c.	p. c.
Water.....	15·56	6·53	12·50	2·67
Salt.....	2·73	1·12	1·84	·48
Nitrogen, N <sub>2</sub> .....	·504	·285	·243	·142
Fibre, N <sub>2</sub> x 6·25 (tissue other than fat).....	3·15	1·78	1·52	·89
Fat by difference.....	78·56	90·57	84·27	95·96
Olein in bacon.....	50·05	58·33	66·37	76·94
Palmitin and stearin in bacon.....	28·51	32·24	17·90	19·02

From the foregoing data we may notice several very important differences in the composition of the bacons. These differences are discussed in the following paragraphs:

1. It is to be observed that the percentage of water in the fatty tissue of the "firm" is greater than in the fatty tissue of the corresponding part of the "soft" bacon.

2. Also, that the percentage of tissue other than fat, that is, of a nitrogenous nature, was also greater in the "firm" than in the "soft." This falls into line with the results stated in the preceding paragraph, since the water for the most part is contained in or held by the nitrogenous tissue. I conclude from this fact that the walls of the cells containing the fat proper are thicker in the "firm" than in the "soft" or "tender" bacon.

3. Further, it is to be noticed that the amounts of salt present are also larger in the "firm" than in the "soft" bacon. This is accounted for by the assumption that the salt, like the water, is held by the nitrogenous tissue to a greater extent than in the fat.

4. The percentages of fat are, from a consideration of the foregoing statements, necessarily greater in the "soft" than in the "firm" bacon.

5. The fat proper consists of olein, fluid at ordinary temperature, and palmitin and stearin, solid at ordinary temperature.

The data show that the percentage of olein is much greater in the "soft" than in the "firm" bacon, while as a natural consequence the percentages of palmitin and stearin are greater in the "firm" than in the "soft" bacon. These facts afford the cause of the greater softness in the "soft" or "tender" bacon.

#### COMPOSITION OF THE FAT.

In order to obtain a fuller knowledge of the composition of the fat proper in the "firm" and the "soft" bacons, the fatty tissue was rendered and the pure fat filtered off. The analysis of these fats furnished the data in Table II.

TABLE II.

#### COMPOSITION OF FAT FROM "FIRM" AND "SOFT" BACON.

Constituent.	FIRM.		SOFT.	
	Ham.	Shoulder.	Ham.	Shoulder.
	p. c.	p. c.	p. c.	p. c.
Olein (calculated) . . . . .	63.71	64.40	79.95	80.18
Palmitin and stearin . . . . .	36.29	35.60	20.05	19.82
Ratio of palmitin and stearin to olein . . . . .	1 : 1.76	1 : 1.80	1 : 3.99	1 : 4.02

These figures show very clearly that the fat of the "soft" bacon contain much larger percentages of olein than that of the "firm" bacon, with a corresponding decrease of palmitin and stearin.

They also make evident that no great differences in the composition of the fat taken from the ham and from the shoulder of the "firm" bacon exist, and that the same statement regarding the fat of the ham and shoulder of the "soft" bacon also holds true.

#### PHYSICAL AND CHEMICAL CONSTANTS OF FAT FROM "FIRM" AND "SOFT" BACON.

Table III. sets forth certain determinations that were made upon the pure, filtered fat. These are of considerable importance, since, though of a strictly scientific character, they allow us to make deductions easily understood regarding the nature of the fats.



TABLE III.

PHYSICAL AND CHEMICAL CONSTANTS OF FAT FROM "FIRM" AND "SOFT" BACON.

	FIRM.		SOFT.	
	Ham.	Shoulder.	Ham.	Shoulder.
Melting point .....	37·6°C.	37·75°C.	27·4°C.	28·2°C.
Spec. Gravity, at 96°C. ....	·8668	·8659	·8678	·8740
" " 105°F. ....	·9009	·8980	·8970	·8988
Sapon. equivalent.....	285·3	282·3	287·3	286·0
Reichert No. ....	·408	·714	·408	·663
Iodine absorbed.....	55·3	55·9	69·4	69·6

1. The melting point of the fat from the "soft" bacon is practically 10° centigrade lower than that of the "firm" bacon.

2. The specific gravities in both series are so close that it is not possible to use this constant as a means of differentiation or for deducing therefrom any information respecting the relative composition of the fats.

3. The saponification equivalent likewise appears to be of little value in the diagnosis.

4. The Reichert number shows the practical absence of volatile fatty acids in both series, though there is an indication of larger traces of the presence of such in the shoulder fat than in that of the ham.

5. The "iodine absorbed" is of great value in this investigation. From it may be calculated the percentage of olein or liquid fat present in a fat. The data here presented clearly demonstrate the larger amount of olein in the "soft" fat, a fact that gives the explanation for the greater softness or tenderness of the "soft" bacon.

We have every reason to be encouraged by the results of this investigation which you will admit has by no means been an easy one. It is a problem which yet requires much careful work before it can be finally solved. Having now the chemical and physical data that allows us to distinguish between the fat of the "firm" and of the "tender pork," it now remains to institute a series of experiments, feeding pigs with various kinds of foods and keeping them under different conditions, such as, with and without exercise, and submitting the pork produced to analysis. These pigs should be killed and analyzed at different periods of growth. In some such way as that the factors causing this "tenderness" will be eliminated; at least, I hope so. Among the facts brought out by this preliminary investigation, the chief is the larger proportion of olein—a fat fluid at ordinary temperatures, in the "soft" pork. Whether this is due, wholly or in part, to the character of the feed, we cannot as yet say. Probably there are several factors. It may be in part an inherited quality. I should not be at all surprised to find that it is. Again it may be caused, in part, by lack of sufficient exercise or too heavy feeding before pigs have attained their growth.

## EXPERIMENTAL RATIONS FOR HOGS.

Associated with Mr. Grisdale, I am now at work on a much more extensive investigation of a similar character. Mr. Grisdale (Agriculturist of the Farm), is now feeding a large number of pigs, according to a scheme we have drawn up. These pigs will be slaughtered and analyzed from time to time to ascertain what effect the various foods and conditions have had upon the pigs.

*By Mr. Featherston :*

Q. Do you consider the "firm" pig to be a healthier animal than the other, is not that right?

A. I am not prepared to say that, though it is possible that "soft" fat betokens an abnormal condition.

We have established a basis for reference and we have begun a further investigation of a very extensive character, feeding nearly 200 pigs. When the work is completed I trust we shall be able to give to our farmers and pork raisers such information as will enable them to avoid the production of soft pork.

We start this experiment with weaned pigs. They will be analysed at all stages of growth until they reach maturity, or rather the weight the pork packers desire them. By this means we shall be able to discover if this olein that I have referred to is developed at any particular time in the pig's life or is there from the first. If we find the very young pigs just off the mother's milk with this soft fat, we may conclude that it is an inherited quality. All the pigs to be experimented with are Tamworths or Tamworth grades.

*By Mr. McMillan :*

Q. Were the pigs that you are experimenting with bought from outside or were they produced on the farm?

A. Some few were littered on the farm, but most of them were bought outside. Some of them came from this district and some of them from Essex and the west, so we have pigs representing both east and west. The reason locality was introduced, was, that some consider soft pork is due more or less to the district in which the pigs are bred and reared. As many factors as possible have been taken into consideration in arranging or settling upon this scheme or this experiment.

*By Mr. Featherstone :*

Q. You have them ready for slaughtering now, have you?

A. The work has just begun. It cannot be completed for six or eight months yet. We shall slaughter them from time to time.

Q. I thought you said you were going to kill some next week?

A. Yes, we are going to kill four of them only, and analyse them; others will be killed at various stages of growth.

#### SAMPLES RECEIVED FOR EXAMINATION FROM FARMERS.

Having now brought before you some of the more important results obtained last year in the branch of original research, I wish to say a word or two with regard to the other classes of work I have been engaged on, and more particularly with regard to samples sent in by farmers for examination. In the following tables I have arranged according to their nature and locality the samples received during the years 1898 and 1899, respectively:—

SAMPLES RECEIVED FROM 31st MAY, 1898, TO 1st JUNE, 1899.

	B. C.	N.W.T.	Man.	Ont.	Que.	N.B.	N. S.	P. E. I.	Total.
Soils .....	3	2	3	3	12	1	5	.....	29
Mucks, mud and marl...	1	1	1	5	2	8	5	7	30
Manures and fertilizers..	2	.....	.....	11	2	4	7	1	27
Forage plants and fodders	1	30	19	21	3	2	10	5	91
Well waters .....	2	6	10	57	10	4	5	6	100
Miscellaneous, including dairy products, fungi- cides and insecticides..	3	6	1	23	6	1	2	6	48
Total .....	12	45	34	120	35	20	34	25	325

## SAMPLES RECEIVED FROM 31ST MAY, 1897, TO 1ST JUNE, 1898.

	B. C.	N.W.T.	Man.	Ont.	Que.	N. B.	N. S.	P. E. I.	Total.
Soils .....	5	.....	3	9	10	5	3	4	39
Mucks, mud and marl...	5	.....	1	7	6	9	12	17	57
Manures and fertilizers..	4	1	.....	3	.....	2	7	3	20
Forage plants and fodders	18	1	.....	16	.....	1	5	2	43
Well waters .....	2	3	4	34	23	2	3	18	89
Miscellaneous, including dairy products, fungi- cides and insecticides..	2	3	1	6	17	.....	7	3	39
Total .....	36	8	9	75	56	19	37	47	287

Last year, that is to say up to the 1st of June of the present month, we received 325 samples for examination; the year before, for the same period, we received 287 samples. These consist chiefly of soils, naturally recurring fertilizers including muck, mud and marl, manures and fertilizers, forage plants and fodders, well waters, and miscellaneous including dairy products, fungicides and insecticides.

*By the Chairman :*

Q. You have apparently a little of everything ?

A. Yes, we get something of everything relating to agriculture, or nearly so.

It is scarcely necessary to say, perhaps, that only those samples which we consider fall within our province to examine, are analyzed.

There is constantly on hand a large number of samples awaiting attention, as of course it is work that can only be taken up as time permits.

Many of the results of these analyses are inserted in the annual report of the chemical division for the reason that they furnish useful information to our readers. Thus many of our reports on soils are of sufficient importance to merit publication, for they contain suggestions regarding treatment and improvement which will be of value to those possessing soils similar in character. The data regarding various natural fertilizers occurring in Canada, obtained from samples forwarded to farmers, are also for the most part published since they serve to make known to others the presence of materials of fertilizing value which can often be obtained at little or no expense.

*By Mr. McMillan :*

Q. Before you leave the matter of soft pork, has a case come under your notice of a lot of hogs, we will suppose a litter of hogs all brought up together and made ready for the market, all being fed together and kept together, and some bacon being soft and other being hard on the same treatment, the same breed and the same feeding ?

A. Indeed, no ; I must confess I have not. Although I have read a considerable amount on this subject, I have never seen any account of that case. There are many and conflicting theories abroad as to the cause of soft pork. It may be due to the breed or to the feed or to both. I don't wish to be understood as speaking definitely, because we really as yet don't know anything as facts, but I am of the opinion, it is only an opinion, that it is not due to any one cause. Probably it was at first induced by feed, and that after a number of years the quality became such that it was acquired either through the mother's milk or they inherited the soft fat when born. Soft and firm pork are, I understand, to be found in all breeds.

*By Mr. Featherston :*

Q. The Swine Dealers' Association in the west are conducting experiments now and Mr. ——— and Mr. Hodson, the Secretary of the Association, told me the



other day they found there is a good deal in the breed, and they are afraid it is going to be quite a question.

*By Mr. McMillan:*

Q. As far as I can see there is a good deal in allowing the pigs to get plenty of exercise and to be kept thriving all the time?

A. I certainly think exercise is necessary to keep them in good health, though I could not say that lack of it caused "softness."

#### WELL WATERS FROM FARM HOMESTEADS.

The work on waters from farm wells, creameries and cheese factories has been continued; we analyzed in the neighbourhood of 100 samples last year. It will be unnecessary for me to emphasize to-day the value of this part of our work, since on several occasions in past years I have dwelt at some length upon the danger to health, stock and dairy products from a polluted water supply.

All farmers and dairymen can obtain an analysis of their well water free of expense, provided they follow certain instructions as to collection that we issue and prepay express charges.

The examination of samples sent in by farmers has been the means of extending a helping hand to the intelligent farmer. It has gained the sympathy and co-operation of our people in the work of this branch of the experimental farm system, a very important matter and convinced them of the practical aid to be obtained through chemistry.

#### CORRESPONDENCE.

The experimental farm is now and has been for some time recognized throughout the Dominion as the bureau from which information can be obtained for the asking on agricultural matters. Letters addressed to us as you know need no postage, but it is not this fact altogether I feel sure that has caused the yearly increase in the number of our correspondents. It is rather due to the fact that it becomes more widely known year by year that information of a helpful and reliable character can be obtained gratis. The letters for the most part contain inquiries respecting fertilizers, cattle foods, soils, the chemistry of dairy products, insecticides and fungicides and allied subjects. Many of them require a certain amount of research and analytical work before they can be answered and it will therefore be obvious that a considerable portion of my time is occupied in this branch of our work. For the year ending last of June, 1899, we received 1,309 letters and dispatched 1,510.

#### BULLETIN ON FARM YARD MANURE.

A bulletin on farm yard manure (No. 31, Central Farm Series) was written and issued last December and was distributed to those on our mailing lists during the earlier months of the present year. It treats of this important subject from all the practical aspects of the question, and no doubt will be found of value for reference by our farmers. From the tenor of the letters acknowledging its receipt we have every reason to conclude that it is not only filling a long felt want but that it will have a good effect upon the negligent and wasteful practices in connection with the preservation of barn yard manure, practices which, I am sorry to say, have been altogether too common in the past.

#### ADDRESSES AT CONVENTIONS.

Addresses have been delivered at some of the more important agricultural conventions in Ontario, New Brunswick, and Nova Scotia since last I appeared before your committee.

## TUBERCULIN.

The tuberculin furnished by the department of agriculture to veterinary surgeons throughout the Dominion is prepared and sent out by us. This necessarily has encroached upon our time, for the quantity now used by the government inspectors is over 10,000 doses per annum. It is important work, however, and we are consequently making arrangements to carry it out carefully and at the same time in such a way that the chemical work proper of the farms may not be interfered with.

## NEW LABORATORIES.

I am glad to report that a new and substantial building, devoted entirely to chemical work, has been constructed at the Central Farm. It comprises two laboratories in addition to offices and weighing rooms on the first floor, storage and sample rooms in the basement, and a suite of three rooms in the attic, two of which will be used for grinding and drying of samples and the third for photographic purposes. The building is now being fitted up and equipped with the necessary laboratory appliances, and we confidently expect to be in a position to move in within a month or two. Since the fire that occurred in 1896 we have been seriously incommoded. The new laboratories will enable us to accomplish more work and with greater convenience than heretofore.

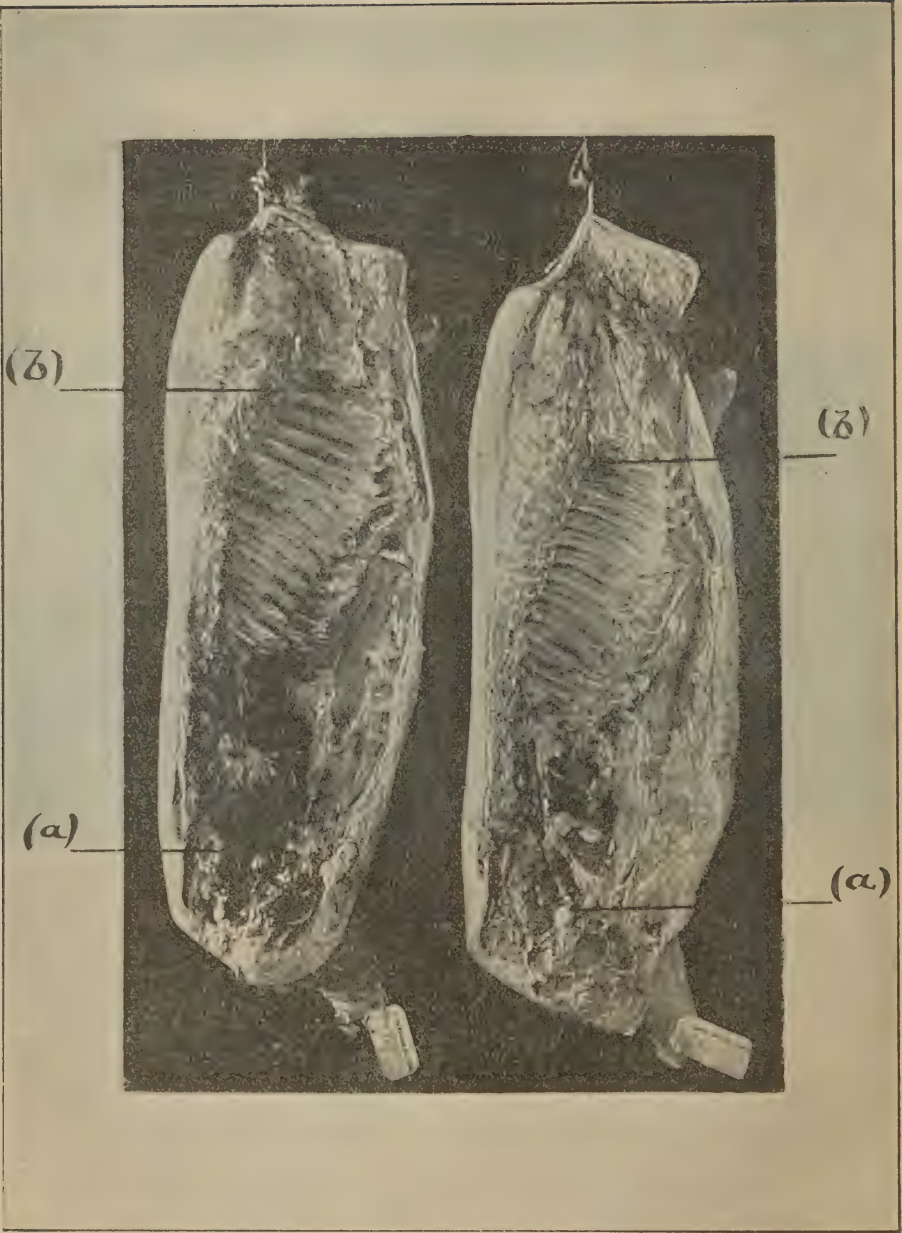
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Having read over the preceding transcript of my evidence I find it correct.

FRANK T. SHUTT,  
*Chemist to the Dominion Experimental Farms.*







## ORCHARD AND FOREST TREE CULTURE.

COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
Tuesday, 20th June, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10:45 o'clock, a.m., Mr. Bain, Chairman, presiding.

Mr. W. T. MACOUN, being present at the request of the committee, made the following statement:—

MR. CHAIRMAN AND GENTLEMAN,—Last year when I came before you it was shortly after my appointment to the position of horticulturist at the Central Experimental Farm, and it was your pleasure at that time that I should speak only of the work of which I had been in charge during previous years, but this morning I should like, if it is agreeable to you, to give you some idea of the work which is going on in all branches of my department, but would deal especially with that part of the work relating to apples, particularly hardy varieties, which are so necessary in growing fruit successfully in eastern Ontario and Quebec.

*By Mr. Cochrane:*

Q. Eastern Ontario; won't your remarks apply to all Ontario?

A. I shall be very glad to answer questions relating to apple growing in any part of Ontario, but as there has been less said about fruit growing in Eastern Ontario and Quebec, I thought it well to speak of that this morning.

Before beginning my address I should like to compare the extent of my department with what it was when in charge of the former horticulturist. The late horticulturist had charge of the fruits, vegetables and tobacco only, at the Experimental Farm, which were grown on an area of about 50 acres. In addition to these 50 acres the present horticulturist has charge of the forest belts, covering an area of about 21 acres, the arboretum, comprising 65 acres, and is also responsible, under the direction of Dr. Saunders, for the appearance of the ornamental grounds, covering an area of about 26 acres. So that the former horticulturist had charge of about 50 acres, whereas the department covers to-day about 150 acres, as a result of which the work has naturally increased considerably.

*By Mr. Wilson:*

Q. Have you any increased help?—A. I have a few more labourers but no more skilled help.

## TREE PLANTING FOR SHELTER.

Before taking up the horticultural department proper, that is, that relating to fruit and vegetables, I should like to give you some reasons why the other branches of the work are supposed to aid and interest the farming community of Canada. Taking the forest belts, which cover an area of about 21 acres, the objects in planting these were to find out how long it would take trees to reach a certain height; the rapidity of growth of each variety; the proper distance apart to plant to get the best results; and the value of trees as wind-breaks for crops grown in the vicinity of them. During each year the heights of a large number of trees in this

belt are taken, and the data obtained are published from time to time. This will be valuable for reference when the time comes to re-forest parts of Ontario, and I think that time is not far distant. It has also been found that much depends on the way in which trees are planted and the proportion of thick and thin foliated kinds there are in the belts. For instance, if a farmer plants a few acres of ash, expecting to reap a large crop in 25 or 30 years, it is likely he will have to expend a great amount of labour to bring these to perfection, because the ash is a thin-foliage tree. By mixing some thick-foliated trees, such as box elder, maple, or other sorts, planted as a cover crop for the ground to prevent the growth of weeds and to obtain proper forest conditions, he will be able to get the best conditions in the shortest time at the least expense. These are a few of the objects and advantages of the forest belt.

#### THE ARBORETUM.

In the arboretum there are being tested as many varieties of trees, shrubs and flowers as possible, the object being to find out which species and varieties are hardy in this section of the country; to offer a field for study to botanists and students; to interest lovers of plants throughout Canada, because amongst farmers as amongst other classes there is a great love of trees, shrubs and flowers. It is also hoped that it will lead to an increased love for trees, shrubs and flowers. We all know that there are many farmers who have no trees or flowers about their homes. There are large excursions to the Central Experimental Farm this month, as in previous years and, it is expected that the impressions made on the farmers by seeing the trees, shrubs and flowers about the farm will induce them to do some planting on their own farms, by doing which, in my judgment, they would make their sons and daughters more contented with farm life, as their places would then become more homelike.

Now, to give you some idea of the number of species and varieties of trees, shrubs, flowers, fruits and vegetables, under my charge in 1898, I shall give a list of them, so that you may understand what a large amount of work there is in even becoming acquainted with them, because it is expected, when farmers write to us or when any one asks personally, that we should be able to give them all the information possible. There were growing last year in the horticultural department, 653 varieties of apples, 69 varieties of pears, 130 varieties of plums, and 50 varieties of cherries, making a total of 902 varieties of large fruits. Then there were 169 varieties of grapes, 80 varieties of currants, 128 varieties of raspberries, 154 varieties of gooseberries, and 290 varieties of strawberries, making in all 821 varieties of small fruits. Of vegetables we had nearly 1,000 varieties; tobacco, 35 varieties; ornamental trees and shrubs, about 2,700 species and varieties, and of perennial flowers 1,200, making a grand total of about 6,658 species and varieties. I am trying as quickly as possible to become acquainted with all of these 6,658 species and varieties, but it will take some time to do so. The number of fruits and vegetables tested will, however, probably decrease as the poorer sorts are discarded.

#### FRUIT GROWING AT THE CENTRAL FARM.

In testing fruits at the farm, there are several objects in view, and I shall speak briefly of each of them. First, there is the testing of varieties to determine their hardiness, productiveness, keeping qualities of the fruit, freedom from blight, scab, and other diseases, and insect pests. Then, particular attention is paid to spraying, the cultivation of orchards, grafting,—a specialty being made of top grafting—recording the blossoming dates of fruits, and keeping records of the yields of trees.

#### VARIETIES OF APPLES.

Now, with regard to varieties. As was said before, there are 653 varieties on the place. Out of that 653 varieties there are not more than twenty or twenty-five which I would like to recommend to any fruit grower in this section of the country.



Some of the others are hardy, but they are unfit for commercial purposes. During the past eleven years a fairly good idea has been obtained of the hardiness and productiveness of the different varieties, their keeping qualities, and also of their freedom from blight.

#### GRAFTING.

At the farm a special study is now being made of top-grafting apples. It has been found that some of the best varieties of apples in western Ontario will not succeed here; not always because the branches are winter-killed, but because the trunk sun-scalds, and because the trees are root-killed in the winter. It is our endeavour, by top-grafting these tender varieties on hardy stocks, to get them to succeed in this district. When the orchard was planted in 1888, several trees of Northern Spy were set out. None of these are living to-day. They have all been killed out by the winter. In 1891, the Northern Spy was top-grafted on the Wealthy apple. This tree produced a fairly good crop of apples last year. The top is very vigorous and there is every indication that if the tree that they were grafted on had been as vigorous a grower as the Northern Spy, the latter would succeed very well, but it was top-grafted on the Wealthy. The Wealthy is not a rapid growing tree and the result is it is getting top heavy and probably will break off before many years are over. What we are trying to discover is the best stock for these tender varieties, and it is hoped that in a few years it will be possible to advise farmers to top-graft Northern Spy, Baldwin, and Ontario, for instance, on certain varieties, with the probability that good results will follow. Particular attention is being paid to this work which was begun by Prof. John Craig, late horticulturist, who planted the trees for top-grafting on.

*By Mr. Featherston:*

Q. What varieties of trees did he plant for bases?—A. Gideon, McMahan White, Haas and Hibernial.

Q. Not the snow apple? I think they are the finest you can get?

A. The Fameuse or snow apple does not succeed as well as some others at the Experimental Farm, although it does very well in more sheltered parts of this vicinity, but the farm is much exposed. Though the trees are doing well, they do not look as thrifty as those iron clad trees I have mentioned. An important thing to avoid is the top grafting of the tender varieties on stocks that do not grow as quickly as they do. The Wealthy is not a rapid grower nor a large tree and if you top-graft the Northern Spy, which is a very vigorous grower, on it, in a few years it will become top heavy, so what is desired is to find a tree that will make about the same growth as the variety which is grafted on it, will be perfectly hardy, and free of sun-scald.

#### SEEDLING FRUITS.

Again speaking of varieties, I might mention that it is our intention to pay special attention to the production of seedling varieties of fruits. This branch of the work has not been carried on very extensively in the past except with the Russian seedlings, and they have not been a success, because the apples are not an improvement on most of the Russian kinds, but my idea is to select the seeds of the best hardy apples grown at the Experimental Farm and plant them. For example, last year we sowed seed of Fameuse, MacIntosh Red, Northern Spy, Winter St. Lawrence and several others. It is hoped that we may be able to plant about 2,000 young seedling trees. I think it is at the Experimental Farms where new varieties should be originated. The best varieties of apples to-day are from chance seedlings, and it seems to me that if a systematic planting of seedlings were carried on it is very likely that some good varieties would be obtained. The great want of Eastern Ontario and Quebec is an apple that will be equal in flavour, colour, and shipping

qualities to the Northern Spy, Baldwin, King and Ontario. There is not such an apple in Eastern Ontario and Quebec.

*By Mr. Pettet :*

Q. The Ben Davis does well, does it not?

A. It does well, but it has not the quality. We have not an apple that has the flavour and shipping qualities of some of the best winter apples. The Ben Davis does well, it is a good, hardy, and productive variety. It is hoped that by using the seeds of these early winter apples and some late apples like the Northern Spy, the Delaware Red Winter and the Lawver, some seedlings will be obtained that will be improved in quality, perfectly hardy, and good shippers. We have two hardy winter apples at the Experimental Farm at present which I consider ideal apples in appearance, and keeping qualities for shipping to Great Britain.

That apple is the Lawver. It has been kept in my cellar during the winter, where there has been several degrees of frost. It is in perfect condition and would keep until September if kept cool.

This other apple is a rather bad specimen of the Delaware Red Winter. The tree seems a little hardier than the Lawver. The Lawver has lived at the Experimental Farm for 11 years. It is not very healthy, but I think will pull through. The Delaware Red Winter was planted in 1890 and is perfectly healthy. This apple would be in as good condition or better than the other apple which I have produced but that it got more frozen and for that reason is not quite so firm.

Q. They were frozen in the cellar and then thawed out afterwards?

A. Yes, they were thawed out afterwards.

Q. How long since they have been thawed out?

A. They have been thawed out I suppose since the 1st of April.

Q. They are keeping quite well?

A. I have an apple like that which has been lying on my desk I suppose for eight or nine weeks, and is not much more shrivelled than that one is.

Q. What is the quality of that apple?

A. It is a little better than the Ben Davis. It is not of good quality, but at this time of the year any one would be very glad to get them.

Q. Why did you allow them to freeze?

A. Because I could not keep the frost out of my cellar.

Q. That was the reason. You had no other special reason.

A. There was no special purpose.

Q. How much frost was there?

A. There were at least three or four degrees of frost in the cellar.

*By Mr. Rogers :*

Q. Do you consider that the frost affects the flavour of the apples?

A. Oh, yes, certainly.

Q. And were these apples exposed to the air?

A. The Lawver apple was in a paper bag with four others. The Delaware Red Winter has been exposed to the air all winter, it has been lying on a table in the cellar. I may say that we had one of those Delaware Red Winter apples which was wrapped in tissue paper in the fall of 1896, and it was shown in Montreal in February, 1899. The apple simply shrivelled up, it did not rot. I have this spring been crossing the Delaware Red Winter apple with the McIntosh Red and Fameuse, in the hope of getting some of the flavour of the McIntosh Red and Fameuse into it and still keeping in the cross-bred sorts the keeping qualities of the Delaware Red Winter. There is one disadvantage in the Lawver and Delaware Red Winter apples. They are not heavy bearers and that is the great disadvantage I see in them.

*By the Chairman :*

Q. That is a very serious one, too?

A. That is a very serious one of course. I do not recommend them for general planting on this account.

*By Mr. Hurley:*

Q. Have you saved the Ben Davis until this time of year?

A. Yes, I have some Ben Davis apples under exactly the same conditions as these but they are considerably shrivelled. You could eat them but they are not in the condition these are.

*By Mr. Rogers:*

Q. Their flavour is not as good?

A. The trees on which these were grown came from Illinois. These two apples, I may say, have been regarded as synonyms by several horticulturists, and they are very much alike. The seeds are very nearly alike but the character of the flesh is quite different, and the flavour is quite different also. The basin of the Delaware Red Winter is deeper than that of the Lawver. An apple of the appearance and keeping qualities of these with better quality is my conception of the apple that is required for shipping to Great Britain.

*By the Chairman:*

Q. That is of very good colour and size?

A. Of very good colour and size.

*By Mr. Featherston:*

Q. It would be all right if you could get the tree to bear well?

A. Yes, and get some quality in it.

*By the Chairman:*

Q. I suppose they would be good for export if you want a bright coloured apple?

A. Yes, for shipping to Great Britain they are required about that size. Larger apples, however, sell well.

#### SPRAYING.

Particular attention is being paid to spraying at the experimental farm, because it is thought that unless the farmers spray now-a-days they cannot make fruit growing a success. I have seen enough examples of the good results of spraying throughout the country to convince me of the benefits of it. We are spraying thoroughly at the experimental farms and advise spraying whenever opportunity occurs. Different mixtures and solutions are also being tried for different kinds of fruit, so that we shall be able to tell the farmer which are the best to use

*By the Chairman:*

Q. For preserving the fruits?

A. No, I mean for preventing fungous diseases and the depredations of insects.

#### BLOSSOMING OF FRUITS.

Work is also being done by the horticultural department which I think will be valued more in a few years than it is now. This work was begun by Prof. Craig, the late horticulturist. Seeing the great importance of it, it has been continued. This work is the recording, by fruit growers in different parts of the Dominion, the dates of blossoming of different fruits. The records are sent to the Experimental Farm for compilation. This has been carried on now for five years. The reason for this work is that horticulturists have found that by placing paper bags over the blossoms of certain varieties of apples and other fruits, thus excluding wind and



insects, the fruit will not set, or if it does there is not a full crop of it. They found by these experiments what varieties of apples and other fruits would set fruit without the aid of wind or bees to carry pollen from other varieties, and by planting these kinds alternately with the other varieties in the orchard there would be better crops on those varieties that will not set fruit well by themselves. The work we are carrying on is to determine the average dates of blooming of the different sorts and what varieties bloom at the same time, as it is also important in planting an orchard to have apples which bloom at the same time, because if you have, for instance, the Northern Spy, which blooms late, and some other varieties which bloom early, the bloom of these would be almost fallen before the Northern Spy opens its buds, and would be of no value for fertilizing. So it is necessary to mix the varieties in such a way that the kinds you wish to have crossed will be in bloom at the same time. It has been found that the Northern Spy growing by itself without any other apple trees in the vicinity will not produce a paying crop for the reason that it is an apple that is self sterile. This work is thus enabling us to find out which varieties to plant together.

*By Mr. Fraser:*

Q. Would you advise planting the whole orchard at the same time?

A. Not necessarily.

*By Mr. Featherston:*

Q. You think the Spy will not fertilize?

A. No.

*By Mr. Cochrane:*

Q. I don't know about that. A neighbour of mine has an orchard of Spys and they fertilize themselves.

A. Perhaps your orchard is near his place, and your trees might fertilize his.

Q. About a quarter of a mile away.

A. Even a quarter of a mile away, the bees fly as far as that I think.

Q. You will find considerable difference in the times of blossoming?

A. Yes, but it is the comparative dates of blossoming of different varieties that we are determining, so that if a farmer writes to us, we can tell him, when he is planting an orchard the kinds to plant which bloom at the same time.

*By Mr. Pettet:*

Q. Did you try whitewashing instead of spraying. Some farmers are using whitewash?

A. In my judgment the only value of whitewashing when it is usually applied is, that very probably it will help to destroy the fungous germs on the trees, and also some of the insects which are lodged there. But I do not think the effects of whitewashing would be nearly as beneficial as spraying the trunks, with the Bordeaux mixture, for instance.

*By Mr. Cochrane:*

Q. Have you ever tried doing the trees over with dry ashes when they are moist, throwing it all over the trees?

A. I have heard that is very beneficial, but we have found that spraying is so effective and so easily done by means of the spray pump, that we have adopted this method at the farm. I have been told that it is well to throw ashes over the trees.

#### EXPERIMENTS WITH WHITEWASH.

In regard to whitewashing, I may say that we tried some experiments at the farm last winter with whitewashing to prevent the swelling of buds. Perhaps some

of you have read of experiments which have been made in the western states, in Missouri for instance, to prevent the swelling of peach buds, so that when alternate freezing and thawing occurs the buds will be kept in a dormant condition and not be affected by the changes of temperature. The theory of this is, that a white substance reflects the rays of the sun more than a darker one, and it has been found that a considerable difference in temperature has been caused by having a white substance on the trees. We have tried this on the farm and found that the buds did not swell as quickly as where the trees were not whitewashed, but it is a question whether it is practical to use this to advantage, as it requires a great many sprayings to keep the whitewash on the trees as the rain washes it off, and unless you keep the whitewash on the trees and keep the branches white it is of no value. Experiments in whitewashing the trunks of the trees are also being conducted at the Experimental Farm. It is an old custom, but farmers have done it I think without knowing exactly why they did it. At the farm we are troubled with sun-scald on the south sides of the trees. This is caused in March, by the sun shining on the south side of the trees and thawing out the tissues on that side. Then at night the temperature may drop ten or fifteen degrees below freezing and the tissues break. This thawing and freezing destroys the tissues through which the sap flows and consequently there is no growth in spring, and the tree dies on that side. Sometimes the injury is so great that all the tree dies. Last winter we applied the theory for the prevention of the swelling of buds; to the prevention of sun-scald. By keeping the trunk pure white at that time of the year, the lowering of the temperature caused by the reflection of the sun's rays may be sufficient to prevent sun-scald. A few years' test should demonstrate whether this will succeed or not.

*By Mr. Rogers :*

Q. Do you whitewash on one side only?

A. We have whitewashed the trunk all around, but it is only on one side where the sunscald is likely to occur. In Minnesota they are using a tree protector which is a slab of wood fastened around the tree with wire, which protects the trees from the sun and prevents mice getting at them in the winter. Some of these have been procured and will be used at the Experimental Farm. They only cost two cents each.

*By Mr. Wilson :*

Q. How long are they?

A. Two and a half or three feet long.

Q. And you get them for two cents apiece?

A. For two cents.

*By Mr. Featherston :*

Q. They are just like a shaving from a basket factory?

A. Yes, something like a basket shaving.

#### THE APPLE ORCHARD.

I have tried to give you some idea of the work we are carrying on at the farm and would like to tell you our experience as to the best way of planting and caring for orchards in this part of the country and Quebec. It has been found at the farm and elsewhere that unless the land is well drained where apple trees are planted they will not succeed. Apple trees, like almost everything else, require land well drained. If they have wet feet they seem to get consumption and die soon. So it is important to get land that is well drained. It is also important to get some of the best land on the farm for apples. A good many people think, perhaps, it is a waste of good land using the best for an orchard—that is those who do not make fruit growing a specialty—but I believe it is important to use one of the best pieces of

land on the farm, because no matter how much manure is put on the land it is not the same as having soil naturally fertile. That natural fertility is usually to be found in a clay loam which does not bake. It is necessary to have a soil which does not bake, as trees will not, as a rule, succeed in that kind of soil. Excellent results are also obtained from good sandy loam soil.

Q. Did you not say that clay land was not good for apples?

A. That is, clay that bakes. I consider good clay loam that you can keep loose is best for orchards, but heavy land that bakes is not.

*By Mr. McMillan :*

Q. With us orchards do well on heavy land, but it is all under-drained and kept in sod all the time, and of course it is generally mulched in the fall of the year?

A. Yes; but you see the difficulty is this, that perhaps the majority of farmers would not treat the land in the proper manner, and if we were to recommend the planting of orchards on clay loam without the stipulation that it should be clay loam that would not bake easily, the best results might not follow.

*By Mr. Fraser (Lambton) :*

Q. Would not mulching overcome baking?

A. Yes, to a large extent.

Q. What do you use for a mulch?

A. As Mr. McMillan says, manure is the best mulch.

Q. Is sawdust any good?

A. Yes, almost anything of a loose character that will cover over the surface of the soil is good.

*By Mr. McMillan :*

Q. Sawdust will make a good mulch mixed with manure?

A. Yes.

*By Mr. Rogers :*

Q. Has the quality of the soil anything to do with the quality of the apples, as in clay soil?

A. I could not tell from my knowledge. I think you will find apples of excellent quality have been got from both kinds of soil.

*By Mr. Cochrane :*

Q. We have as fine orchards as there are in our section on very light ground?

A. Excellent results can be had on light sandy soil.

It has been found advisable in eastern Ontario and Quebec, to plant trees on a northern slope on account of sun-scald. By planting them on a northern slope they are not so exposed to south winds and the action of the sun, which cause so much injury in early spring.

*By Mr. Wilson :*

Q. You say a northern slope is better for an orchard than a southern exposure?

A. Yes, for apples.

Q. I always understood the reverse?

A. You see with us in Eastern Ontario it is very important to get a good covering of snow and it is also important to prevent the sun-scald; these are two important factors, a good covering of snow to prevent root killing and something to prevent sun-scald in spring.

Q. Does it affect orchards in winter if the snow goes off early?

A. Yes.



*By Mr. Rogers :*

Q. A southern slope encourages early budding ?

A. Yes, and if the blossoms come out early they are more liable to be affected by changes of temperature.

*By Mr. Wilson :*

Q. Does that apply to Eastern Ontario only or to all Ontario ?

A. It is the general impression all through Ontario that a northern slope is best. Opinions are divided as regards peaches, but I think the majority favour a northern slope.

*By Mr. Cochrane :*

Q. There is not so much difference in the time of blossoming in our district. I have an orchard on the northern slope and I find the trees there all grow together even with the rest.

A. Before planting the trees we believe it is very important to give the land as thorough a preparation as you would for a root crop, because it is of the utmost importance to get the young trees started properly. It is just as with live stock, if you do not give the young animals a good start they remain stunted, and so it is with trees, if they do not get a proper start they get stunted. In many places in Ontario trees are planted in poorly prepared soil; the sod forms about them; they become prematurely old; they are stunted and sickly looking; and you cannot get a paying crop from them. The young trees should be encouraged to grow as much as possible during the first few years, and in order to do this the soil must be kept cultivated. After the tree comes into full bearing it is not so important, although it still is important in many cases.

*By Mr. Cochrane :*

Q. As regards the cultivating of young trees, there is no doubt about the benefit of it. As an illustration of that, I got a dozen young trees and I set eight of them out in a row on the east side of a little orchard and put four of them on the south side of a wire fence and there has never been any grass allowed to grow there. Of course they have not always been kept harrowed around, but the trees have been thoroughly cultivated, and there is no man in the room that would possibly believe that those trees are out of the same bunch. The others were not cultivated only the grass has been kept from the trees for perhaps about four feet, either way. But you would not think they were the same kind of trees.

*By Mr. McMillan :*

Q. Do you not think that when the trees grow rapidly to the end of the year that they are more liable to be killed by the sun in the spring ?

A. If you cultivate until late in the autumn so as to encourage growth through the whole season then you are likely to get them killed. We have always advocated stopping cultivating not later than the middle of July so as not to encourage late growth, and that the wood may become well ripened.

*By Mr. Cochrane :*

Q. Do you put a green crop around the trees to keep down the weeds ?

A. The method we adopt at the Experimental Farm is different from what is recommended for most orchards. We have a light sandy loam soil with plenty of moisture in it. Clover is sown in the spring. Before sowing it, a crop of clover is ploughed under. The clover sown in the spring is allowed to grow through the summer, but may require cutting once or twice, the clover being left to rot where it falls. It grows enough before winter to make a good cover crop, holding the snow and protecting the roots of the trees. The following year the clover is allowed to

grow again. It is cut several times through the summer, the crop being left in the orchard to rot. The following spring it is ploughed under and the land re-sown with clover. This seems the best method to adopt with soil such as that at the Experimental Farm.

*By M. Cochrane :*

Q. How can you cultivate your trees and have a clover crop on the land ?

A. Our trees are ten years old.

Q. I was talking in respect to the cultivation, and you advise stopping cultivation after a certain time. Are you not troubled with weeds ?

A. I did not quite understand you. I was giving our method and will now give the method we recommend for soils that are heavier than ours. Our idea at the Experimental Farm is to improve the soil as rapidly as possible and when it gets better I may adopt the method generally recommended. The plan we recommend is to cultivate until the middle of July and then seed down with red clover, twelve pounds to the acre. By autumn a fine cover crop is procured which is left the following spring until about the third week of May and then ploughed under. The soil is then cultivated until the middle of July and then re-sown with clover.

Q. Do you use scarlet clover ?

A. That is not hardy with us.

*By Mr. Pettet :*

Q. You don't think it is important to cultivate after the orchard obtains a certain age ?

A. I do think it is important. If I had an orchard I would certainly keep it cultivated.

*By Mr. Cochrane :*

Q. We find in our section, we have been cultivating a big orchard, that when the fruit begins to bear down the limbs you cannot cultivate it, and then if there is not some green crop we find the weeds come and interfere with the roots of the trees ?

A. Yes.

*By Mr. Pettet :*

Q. Have you tried buckwheat as a cover crop ?

A. Buckwheat exhausts the soil rather than improves it and would kill out in winter.

*By Mr. Cochrane :*

Q. Have you tried pease ?

A. A crop of clover planted the preceding year was ploughed under and the land reseeded with pease.

*By Mr. Featherston :*

Q. At what time ?

A. It was ploughed under about the 1st June. The land was reseeded with pease, the pease were ploughed under and the land reseeded with clover, and a cover crop was formed by winter. That was two crops of green fodder ploughed under last year. The land was very poor.

*By Mr. Pettet :*

Q. Do you approve of having pigs in the orchard ?

A. Not unless you can keep them from destroying the trees.

*By Mr. McMillan :*

Q. If you can keep the pigs from injuring the trees don't you consider it good ?

A. If you have no small trees, I do.

*By Mr. Cochrane :*

Q. You think they often kill the trees ?

A. I do.

Q. In an orchard of bearing fruit trees about six inches in diameter we allowed the hogs in. In an orchard of a half acre they killed half a dozen trees.

MR. McMILLAN—We find that the codling moth is not half so thick in an orchard where the pigs are allowed as in some others.

*By Mr. Erb :*

Q. Do you consider that when you cease cultivating the orchard that the growth of the tree stops.

A. It does not stop at once. By stopping the cultivation you do not encourage the growth to go on. I consider it very important to cultivate old orchards when it is possible to do so. But if a man has had his old orchard under sod and some one says to him "start cultivating your orchard" he has to be very careful in doing it. I knew a man in Montreal who was advised to start cultivating an old orchard he had and he ploughed it in the fall. The result was he had a lot of trees killed. One has to be very careful unless he adopts this system from the beginning. If you are going to plough the land I would say plough it in the spring.

*By Mr. Pettet :*

Q. You don't recommend fall ploughing ?

A. No.

Q. I understand in the Annapolis valley they leave their orchards in sod for years ?

A. Some of them do. Most of them, I think, cultivate. There they plough in the fall as their trees are not often injured by winter.

*By Mr. Wilson :*

Q. Don't they raise the best apples in Canada ?

A. I saw their apples last winter and whereas their apples are certainly very fine, most of them seemed to me coarser and lacking the fine flavour our apples have.

Q. How do you mean the flavour ?

A. For instance, I tasted the Wagener there which is a fine flavoured apple in Ontario and I did not consider the quality as good. Other examples might also be given.

Q. Can you give any reason for the difference ?

A. No I cannot, unless it is in the climate.

*By the Chairman :*

Q. Did you test their Gravensteins ?

A. I did in the autumn. I tested some from the lot sent to the Omaha exposition and they were very fine.

Q. I think they pride themselves on it ?

A. It is very fine and has a very high flavour.

*By Mr. Cochrane :*

Q. How about bearing ?

A. It is a heavy bearer.



*By Mr. Wilson :*

Q. I understood the Annapolis Valley apples were the best in Canada?

A. The Annapolis Valley people have a reputation for the Gravensteins and it is grown to perfection there, and they are wise in boasting of it.

Q. Do they only grow small quantities?

A. Oh no, they grow large quantities.

Q. That is the staple?

A. Yes that is the staple fall apple.

*By the Chairman :*

Q. They have several specialties?

A. Yes.

#### MAINTENANCE OF FERTILITY.

*By Mr. Featherston :*

Q. Do you consider that it is possible when you have the land in your orchard in a prepared condition, to keep the land in the orchard up properly without using manure, by putting on crops the same as you are talking about now, namely, pease, clover, or anything. Do you think it is possible to keep the land in a proper state of fertility in this way?

A. I had in my notes here a heading "Maintenance of Fertility," and I might perhaps speak for a few moments on it.

Q. That is an important subject with us, because the orchards are getting so large that there is no manure for the rest of the farm after they are manured?

A. If the trees are planted in good soil, and properly cultivated when young and there are no other crops taken off them they do not require, in my judgment, any manure till they come to bearing, but if crops are taken off during these first few years, which is usually the case, there should be as much fertilizer put on, as is taken off by the crops.

*By Mr. Cochrane :*

Q. We will take an orchard in good land, a young orchard that is just commencing bearing. Now from that stage on can that orchard be kept in a proper state of fertility to produce a good crop of apples without cultivation?

A. No, sir, in most cases, it cannot, economically. And I would advise the application of barn-yard manure and also ashes in addition to the clover. If you adopt the plan of ploughing in clover every year you do not require as much manure but if you do not it is well to apply manure at least every third year. I would put on about 50 to 75 bushels of ashes or if you cannot get ashes, kainit or muriate of potash is good; also superphosphate if not much wood ashes are used.

Q. How much ashes?

A. Fifty or 75 bushels per acre every three years.

*By Mr. Pettet :*

Q. When you say manure you don't mean to put it on the roots of the trees.

A. No, scatter it broadcast.

*By Mr. Cochrane :*

Q. Why?

A. You can understand from what was said a while ago that when the trees get into full bearing the feeding roots are some distance from the trunk.

Q. You don't think it is better to put it up around the trees.

A. No, in the middle of the rows.

Q. The reason I asked that is in order to have it officially stated. I say it should be put in the middle of the rows. I have in my mind's eye one orchard where the man every time he puts any manure on his trees has put it down around the trees.

A. I do not think that is right.

*By Mr. McMillan :*

Q. In an old orchard where it is pretty well spread do you think it is well to put the manure on the surface or to plough it in. My opinion is that in an old orchard the roots are spread and the fine roots that get the nourishment for the trees are near the surface and when you plough you cut off these roots. I believe in mulching the orchard putting the manure right on the surface. We have an orchard, we have owned the farm on which it is situated since 1870. We never plough the orchard and it continues to yield yet, but it is manured regularly.

A. Yes.

Q. I don't understand the amount of ashes you named. How much would you put around a tree bearing two or three barrels of apples; what would you consider a fair dressing for a tree like that?

A. About a bushel and a half.

*By Mr. Pettet :*

Q. Do you put it around the tree or sow it broadcast?

A. It should be spread broadcast. It is required some distance from the tree.

*By Mr. Cochrane :*

Q. What is your opinion of lime?

A. Lime helps to liberate the plant food already in the soil, besides furnishing nourishment to the trees. Most soils have sufficient lime, but if they have not, wood ashes will supply all that is necessary at the same time furnishing potash.

Q. Isn't there a great deal of lime in the apple?

A. Not very much in the apple itself, more in the trunk, branches and leaves.

MR. COCHRANE.—I am only asking you this because there is a gentleman named Symmons, a wealthy apple dealer, one of the first men that took an interest in the apple industry, and he is wealthy and has a farm and is trying experiments with it by putting lime on the land, his theory being that although ashes and barn-yard manure are good, yet lime is required to be put around the tree because there is a great deal of lime in the composition of the apple itself.

MR. McMILLAN.—Is it a heavy clay soil?

MR. COCHRANE.—No, it is what we call a clay loam.

THE CHAIRMAN.—Is there any limestone in it or is it granite formation?

MR. COCHRANE.—There may be a little limestone in it.

MR. MACOUN.—I may say that as a rule there is enough lime in the soil. It is very seldom that the soil used for an orchard is lacking in lime. Of course the quantity of lime usually depends much on the formation of the soil.

*By Mr. Featherston :*

Q. I found that around the mountains in our district the apples are better than on the other land?

A. Indeed.

*By Mr. Cochrane :*

Q. Have you done anything in salt for fruit?

A. I do not think it is necessary.

Q. It is not a manure in itself?

A. No.

#### SPRAYING.

*By Mr. Cochrane :*

Q. Have you been treating the subject of spraying in connection with the worms on the trees?

Q. I did not go into details regarding the spraying.

Q. That is a very important subject and there is a difference of opinion among us. I would like to get yours. They have been adopting spraying where I live to a considerable extent and there was quite a discussion when I was up among the neighbours with reference to whether spraying would kill these worms. Some of my neighbours took the ground that you cannot kill these worms. It appears there are two distinct species, one that cover themselves with a web and nest on the trees and another which does not take that precaution. They travel and when they come to an orchard they leave it as if fire had gone over it. If you hit the tree they will drop down on the ground on a web and then it appears they cut loose and do not go back by the web but up the trunk of the tree and they are being very destructive and the question among my neighbours is why did not spraying kill these worms when they were eating the foliage of the tree?

A. I think we were as much, or almost as much, troubled with caterpillars at the Experimental Farm this spring as in any other part of the country, but any member of parliament who comes out to the Experimental Farm will not find many trees which have been stripped by caterpillars. I think the reason of this is that we took them in time. When the caterpillars get to be a large size it is very much more difficult to kill them than it is shortly after they are hatched. At the Experimental Farm we watch carefully for the hatching season, and shortly after they are hatched we spray the trees. That is, when they start to feed, we start to spray. There is no doubt that you can kill them by spraying at that time and that very quickly. But if you wait until they get almost full grown it takes longer to kill them.

Q. Have you been troubled with these species of caterpillars with a web?

A. Yes; it is the tent caterpillar, the other is the forest tent caterpillar which does not make a web. The forest tent caterpillar is that which has been stripping the forests near Ottawa.

Q. They don't seem to be as bad on the maples?

A. No, this spring they seem to have gone for the poplars more than other forest trees.

Q. Where do they hatch?

A. This year the eggs of both kinds were on the apple trees; they form little rings of eggs on the stems.

Q. Is there any difference between the eggs of the two kinds?

A. The forest tent caterpillar's eggs are in clusters cut off abruptly at each end. The tent caterpillars eggs are in clusters which slope off gradually at each end. You cannot make any mistake between the two. A good plan is to have the boys go through the orchard in the winter and climb up the trees and take them off. It is wonderful how many can be destroyed in that way.

Q. It is getting to be a great trouble in our district?

A. Yes, but you can get rid of them if you take the matter in hand early, but you have to take them in time and fight them persistently.

*By Mr. Cochrane :*

Q. There is one kind that does not go into the nests at all. They crawl up on the trees more or less around each other. I can't see when they eat the foliage, why you cannot put the Paris green on strong enough to kill them, or are you afraid of killing the foliage?

A. Yes.



Q. The wild cherry tree all over the country is, I believe, a breeding ground for caterpillars?

*By Mr. McMillan :*

Q. The last day I was out at the farm I saw a large number of them just as I went into the gate. There was a lot of maple trees there and every maple tree had a little bunch of caterpillars on it.

A. We must have missed them, and I will take a look at them when I get back. But I do not think you saw many of them.

Q. Just inside the gate there are four or five maple trees and they are all on them?

A. I will look after them as soon as I get back.

*By Mr. Cochrane :*

Q. I notice that when driving back from Campbellford I found that the white oaks, white ash, and basswood trees were more affected than anything else. I didn't see that the maples were affected at all, but the white oak and white ash and basswood. Will that kill them because the leaves are stripped off?

A. No, I think not. It will weaken them, but it will not kill them the first year. If they keep stripping off the foliage every year, however, the trees will, probably, soon die.

*By Mr. Featherston :*

Q. Have you lost any plum trees, owing to the caterpillars?

A. We lost some plum trees, but that was by winter killing.

Q. Ours are all going except the large green gage trees?

A. Dr. Fletcher and myself prepared a spraying calendar which was sent to about 5,000 fruit growers and others, and will be mailed to any one who applies for it. With the permission of the committee I should like to incorporate this calendar in my evidence.

*By Mr. Cochrane :*

Q. It is very important. There is one point I would like to ask you about and that is if you experimented and found the solutions were as strong as the trees could bear in connection with these caterpillars. You talk of killing them by spraying or by taking the nests out, which do you mean?

A. The principal means we used to kill the caterpillars in our apple orchard this year was spraying. They were nearly all killed by spraying.

*By Mr. Featherston :*

Q. All these caterpillars were killed by spraying, do you say?

A. Yes, nearly all; there were a few of them taken off by hand, but the most of them were killed by spraying.

Q. And your solution was the single thing that killed them?

A. Yes.

Q. How many times did you spray?

A. We sprayed about three times, while we found the caterpillars were at work; but at the same time Bordeaux mixture was applied with the Paris green so as to prevent and destroy fungus diseases.

*By Mr. Cochrane :*

Q. I can tell you this; there is a spraying station at Colborne and I think my sons sprayed the orchards according to directions there, and the spraying did not kill the caterpillars there.

A. As I said before; we recommend four ounces of Paris green to 40 gallons of water; that seems a small amount but there is this to be taken into consideration, that this is given with the supposition that the trees will be sprayed at the proper time. If these caterpillars are not sprayed till later, then four ounces will not kill them as quickly as is desirable and rain may come before it takes effect and wash it off the trees. A larger proportion of Paris green can be used without injury, but on some fruits it would burn the leaves, and it is better where more than four ounces to forty gallons are used to mix lime with the water.

*By Mr. Pettet :*

Q. I never heard any complaints in Prince Edward County?

A. If trees are sprayed in time this mixture is strong enough, but as I said, when it is delayed the poison is not strong enough.

#### PRUNING TREES.

Just a very few words more, in regard to the pruning of trees at the time of planting, and the best method of heading the trees. A low head is best for this part of the country. The fruit growers of western Ontario go in for a high trunk, four feet or more, but we recommend a very low trunk of about two feet in length. A good many of the trees on the farm are more than that, but those we are propagating we try to make low. By this method it is thought that the trees get more protection and are able to bear the crop better and are not so much influenced by winds. We are recommending this method to fruit growers, and even in western Ontario I think it would be a better practice than at present adopted.

*By Mr. Wilson :*

Q. This would make the trees small and they would bear less?

A. You will get the trees large enough.

*By Mr. Cochrane :*

Q. The trouble we find is that they are not high enough to get in to cultivate?

A. When the trees get large the feeding roots are not near them, they are away out.

Q. You will have to go near the tree to cultivate the soil and with low heads you cannot do this?

A. The branches come down near the ground, but the feeding roots are out between the rows and you can cultivate without having to go under the trees.

Q. Now, that is only a theory; have you any practical results which induce you to recommend that?

A. We have found at the Central Experimental Farm that trees planted for ten years, which have low trunks, are succeeding better than the others.

*By Mr. Featherston :*

Q. There is an orchard near the Grand Trunk line between Toronto and Hamilton which is 20 years old, and now I think it is the finest orchard I know; the trees are branched out within two feet of the ground?

A. Yes, that is what is recommended.

MR. COCHRANE.—Were they branching out or running up?

MR. FEATHERSTON.—Branching up.

MR. COCHRANE.—Tapering up in pyramidal forms?

MR. FEATHERSTON.—Yes.

*By Mr. Cochrane :*

Q. Is that your experience here, Professor?

A. Yellow Transparent is a pyramidal tree.

Q. How about the Tallman Sweet ?

A. They will branch down.

Q. How would it be if you left Tallman Sweet two feet up and they branched down, you could not get around at all ?

A. Certainly you could.

Q. I mean you could not get under the tree ?

A. No, you could not, but I think when a tree gets as old as that the roots are far enough out to make that unnecessary.

*By Mr. Featherston :*

Q. That is the feeding roots ?

A. Yes. They are near the centre of the rows, and you do not need to go under the trees, and then you can spray and get at the caterpillars much easier.

*By Mr. McMillan :*

Q. It is not so easy to keep an orchard from growing ; we have some very tall trees ?

Q. In our part of the country the trees do not make such a vigorous growth as in some other parts of Ontario and in the Annapolis Valley, for instance, where they get very large trees.

*By Mr. Pettet :*

Q. What time of the year would you advise pruning ?

A. March or April would be the best time, taking everything into consideration.

Q. March and April ?

A. March and April is when one has the most time for that sort of thing.

*By Mr. Cochrane :*

Q. We are not concerned about when the farmer has most time, but when is the best time of the year ?

A. I believe, having the knowledge of experiments carried on during every month of the year in the United States to determine the best time to prune and to a certain extent from experience at the farm, that it does not matter very much what month of the year you prune in, as far as the effect on the health of the tree is concerned ; but one advantage in pruning in the spring or early summer, is that the wounds will heal over to a certain extent by autumn, as where the wound is not painted or covered with some substance to exclude air, rot is more liable to start around the wound, if the tree is pruned after the growth ceases as there is no growth about the wound until the following spring.

Q. Does not that apply to a certain extent if the pruning is done in March ?

A. The growth starts in about six weeks.

Q. I have a neighbour that satisfied himself in that regard. On the same tree and under the same conditions he cut off two limbs just about the same size, one in March and one in June, and he said that with the same conditions as far as he knew the one he cut off in June did much better as far as healing was concerned.

A. I consider that the best time to prune is when the trees are growing thriftily, but time is money to the farmer, and we have found that very good results will follow by pruning in March. Of course if a man has plenty of time in June when the trees are growing they will heal up better.



## LIST OF BEST HARDY APPLES.

The following is a list of the hardiest and best apples for districts where the winter is somewhat like that at Ottawa :—

Summer.	Fall and Early Winter.	Winter.
Yellow Transparent, Red Astrachan, Duchess.	Wealthy, McIntosh Red, Fameuse, Wolf River, Winter St. Lawrence.	Scott's Winter, Canada Red, Golden Russett, Gano, Ben Davis.

*By Mr. Cochrane :*

Q. What is Gano?

A. Gano is a seedling of Ben Davis.

Q. Yes, I know, but have you tested that?

A. Yes.

Q. It bears all right, but about the flavour?

A. The flavour is no better than Ben Davis, but it is better in colour, and is quite hardy.

*By Mr. Pettet :*

Q. You never recommend Northern Spy?

A. I am in hopes by this top grafting already spoken of to get the Northern Spy to succeed here.

*By Mr. Wilson :*

Q. What about the Spitzenberg, it is a beautiful apple?

A. Yes, but it is not so generally known as it once was. Baldwins, Ben Davis, Northern Spy and Ontario are four of the best paying apples in Ontario, where they can be grown successfully.

*By Mr. Featherston :*

Q. Is Ontario a heavy bearer?

A. Yes.

Q. Is it like the Northern Spy?

A. Somewhat like the Spy, but much earlier in coming into bearing.

*By Mr. McMillan :*

Q. In our part of the country Baldwin, Spy, and Greening are grown, but Spy and Greening do not grow half the apples. Though the trees grow well, the fruit does not do well. The Baldwin is the best with us. We had a tree that we took five barrels off.

A. That is a very good yield. If there is nothing else that the members wish me to bring before the committee, I shall consider my address closed.

*By Mr. Rogers :*

Q. Have you any way of getting trees to bear well every year, like Tetofsky?

A. Trees can be brought to bear nearly every year, not heavily, but fairly, by thinning the fruit. That is, supposing you have a heavy crop this year, thin the fruit when the apples are small, shortly after they are set, and you will be liable to get another crop the following year, but that is not always the case.

*By Mr. Hodgins:*

Q. Would you advise pruning or just nipping off the buds?

A. I would not thin, until you know what crop you have got, because you often have a fine show of blossoms and a small crop of fruit.

Q. How would you thin them?

A. Pick off at least half of them after they have set.

*By Mr. Fraser (Lambton):*

Q. The professor spoke about the difference between the varieties of trees and their fertilizing instincts. I think the interests of fruit growing generally would be promoted if he would give a formula for the planting of an orchard of say 1,000 trees. Supposing a farmer were planting five varieties, how many of each should he plant?

A. Of course that would all depend upon the purpose for which he would plant, whether it was for export or for the local market. There are so many different varieties and the requirements for the export and local market vary very materially.

*By Mr. Cochrane:*

Q. We do not want any apple trees at all for the summer market in our district. We don't pretend to plant any trees of that kind at all.

A. I may say that I agree with the members who have spoken about the wisdom of not planting summer varieties in any section of the fruit-growing districts of Ontario and Quebec. From what I have learned and seen, I believe that the country is simply overstocked with summer fruits. We have a large number of very hardy varieties of summer fruits and one reason why the people planted them was, that they are hardy and bear early, the result being that when there is a big crop there is very little profit in them, whereas if they had a large number of winter apples, or apples they could export with profit, it would be all right. The number of trees of summer varieties, such as Yellow Transparent and Duchess, that would be planted in an orchard should be limited to a few, except in certain cases, as all that is really required of this kind is for home consumption, as the fruit-growers who have large numbers of these trees already planted can supply the market. Therefore, I would advise planting the kinds suitable for export.

*By Mr. Rogers:*

Q. The Maiden's Blush is a very well known apple with us.

A. It is not hardy here.

Q. We have kept them until April.

A. The tree is not hardy here.

Mr. McMILLAN.—The question is, what variety you would plant if you were setting out an orchard?

*By Mr. Fraser:*

Q. I think I understood you to say that the different varieties blossom at different times, and that it is necessary in setting out an orchard to select the varieties which will prove valuable in fertilizing each other, and what I would like to know is if you were planting an orchard of 1,000 trees of say five varieties, what varieties you would plant in order to bring about the best results in regard to fertilizing and volume of crop?

A. I should plant different varieties in this district than in other sections of the country.

Q. I am speaking of western Ontario where I live myself in the county of Lambton, which is a very good county for fruit.

Q. Ontario, Baldwin, Ben Davis, Cranberry Pippin, Roxbury Russet and Blenheim Orange are all good varieties to plant, but certain varieties do better in certain

districts, and it would be unwise to recommend only a limited number of varieties. The best method is to find out what varieties are doing best in a district and plant them, taking into consideration their relative dates of blooming and self sterility or fertility.

Q. You would recommend then, probably, those varieties, only, in the same orchard?

A. The apples I have named are those which bring the best prices and are the most profitable. It seems to me that if any man is going into fruit growing for profit he should plant the apples which will give him the best crops and the best prices and not grow a large number of varieties, because, as a gentleman stated in giving evidence here not long ago, when one sends his fruit to the British market he can do better if he has a large number of barrels of the same kind of apples than if he has a few barrels of each of many kinds.

*By Mr. Pettet :*

Q. The Ben Davis is the most profitable in Canada to-day, is it not?

A. One of the most profitable.

MR. McMILLAN.—But does it find as good a market in England as the others. The appearance of the apple is good but the quality of the apple is not as good.

*By Mr. Fraser :*

Q. You would not recommend planting a thousand trees of one variety; you believe in mixing them?

A. Yes, I believe in mixing them.

*By Mr. Featherston:*

Q. I find I would not be without my Duchess apples where I live, near Toronto. I think the Duchess tree is worth any other two.

A. You probably have a good market in the city, with special customers.

MR. PETTET.—We can't sell them at all.

MR. FEATHERSTON.—We sold all of them we had last year at about two dollars a barrel.

MR. COCHRANE.—You can get lots of them lying on the ground around our parts.

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Having read over the preceding transcript of my evidence, I find it correct.

W. T. MACOUN,  
*Horticulturist.*



## POULTRY RAISING FOR PROFIT.

COMMITTEE ROOM 46,  
HOUSE OF COMMONS,  
22nd June, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 o'clock a.m., the Chairman, Mr. BAIN, presiding.

Mr. A. G. GILBERT, being requested by the committee gave the following evidence:—

MR. CHAIRMAN AND GENTLEMEN OF THE COMMITTEE:—Allow me to express my pleasure in again meeting you. I intend this morning, with your permission to speak, and speak very briefly, of—

Poultry development;

Experiments to show the difference in the laying of eggs in winter by pullets and old hens;

Experimental work in connection with the fattening of chickens and perhaps a few words, if time will permit, on artificial incubation.

## DEVELOPMENT OF POULTRY PRODUCTIONS.

In regard to the poultry development, I will read a few extracts from letters received from persons in different parts of the country, and I do so because two or three years ago a member of this committee requested me to give, whenever the occasion arose, instances of poultry development in any shape or form. First I will read a letter from a clergyman in Hantsport, N.S., in which he says:—"Really stirred up by your lecture at Grand Pré and desirous of giving some of my parish boys an object lesson, I started on 1st January, this year with twenty-five hens and a cockerel, nineteen were barred Plymouth Rocks, nearly pure, two Black Langshans, pure and four mongrels. When outing time came they had a yard ninety feet square with plenty of grass and clover. Their quarters were warm, but too cramped. Their rations mostly along your line, and kept their pen fairly clean. I give you my account to 30th September, as follows:—

Account with twenty-five hens from 1st January to 30th September, nine months, 1898.

## INCOME.

2,500 eggs at 15c. per doz. (a very low price).....	\$31 25
52 chicks at 50c. per pair .....	13 00
Poultry sold .....	15 60
	<hr/>
	\$59 85

Without going into particulars, he makes \$59.85. The cost of food, etc., was \$26.94, making out of his first attempt a profit of \$32.21 out of thirty-nine hens. He says that he began to kill off his hens on 1st July, and by 15th September, had but six left. His best month was March with 460 eggs. "Had I been attempting business," he says, "I should have easily realized thirty cents each for my chicks and

much more on my eggs by higher price for hatches. I regard the whole affair financially as the minimum of success."

*By Mr. McMillan :*

Q. Does he say what he got for his eggs by the dozen ?

A. Yes, fifteen cents a dozen at one time. I do not give the particulars, but they are on a very low scale.

*By Mr. Wilson :*

Q. He could not have had any eggs in the winter to sell.

A. No, sir, but perhaps it is just as well to take the calculation under the most unfavourable circumstances.

*By Mr. Featherston :*

Q. That is the average sales.

A. Yes, from 1st January to 30th September, the average price was 15 cents a dozen for his eggs.

The next letter is from Mr. H. Strong of Dutch Village, Halifax. He wrote me some two or three years ago and I told him how to proceed. I received the following letter from him last fall :—"I am just finishing another poultry house 15 x 45 and expect to winter about 350 or 375 hens this winter. I have a fine lot of early pullets. I am determined to make a success of this enterprise and any assistance you can give me I will appreciate very much. Although I raised so many chicks this season I ran short for my customers and had to go to the country and buy up 200 to pull me through. I have the cream of the city trade; I have the best customers in the city. I inclose you a copy of a circular I sent out from time to time with good results. Then one customer tells another and so on. And now I am refusing orders nearly every day. But next year I will be in a position to handle them all. I am doing away with all breeds but Silver and White Wyandottes and Barred Plymouth Rocks." I advised him to breed all the chickens he possibly could, of the larger breeds, and so raise a superior quality of poultry flesh. To go into the city and find out the customers anxious to buy a superior article and for which they were willing to pay a superior price, and, you see, he has made a very great success of his venture.

The next is from a member of a firm in Annapolis, N.S., who are starting in the poultry business on rather an extensive scale. He says:—"We have made a start in the poultry business on a somewhat extensive scale for this part of the country. We intend raising broilers and roasters for the nearby city markets and possibly for the Boston market. We do not intend doing any egg business. We have erected two buildings each 50 feet by 30 feet." After describing the buildings he says, "In each pen we keep fifteen hens and one cock, using all fertile eggs for hatching. In the other building we have a room 18 feet by 30 feet, along one side of which we propose having 5 four hundred egg Prairie State incubators and on the other side four 4-section floor brooders, heated by the hot water system. We also have a room for work room, store room, etc., 12 x 38 and an office, etc., 12 x 12." He asks, "First. Do you see any reason why a plant of this kind should not be a success if attended to?"

"Second. Can you specify any particular system of feeding peculiarly adapted to this climate that should assure a reasonably large number of fertile eggs?"

"Third. Can you also specify any system of raising and feeding brooder chicks that is specially adapted to this climate?"

I need not tell you I furnished him with all the information in my power, and I hope by this time the firm is in a fair way to success.

The next is from near Yarmouth, N.S., and explains itself. "I am a very poor man. I do not know how to feed scientifically and I have to take what I can get and make the best results I can." His poultry netted him in one year, including chickens sold for table use a profit of \$27.98 out of 31 birds.

Another Nova Scotia letter, it is from Mr. W. H. Woodworth, of Berwick, who says, "I have sold last season and this 1,200 birds. I reared about 700 and bought the rest. I think the two years' work will net \$200 profit."

I now come to Ontario: I will read a letter from a farmer, Mr. James Laidlaw, of Guelph. I should explain that when at the meeting of the Ontario Poultry Association, in Guelph, I delivered an address. Afterwards Mr. Laidlaw asked if I could put him in the way of getting the high prices for winter eggs that I had mentioned. I told him to send a sample crate to Mr. Walter Paul, family grocer of Montreal, and that I would also write. He said he would do so and let me know the result. He says in his letter: "As you advised me I sent a sample consignment of six (6) dozen to Mr. Walter Paul, of Montreal, on Friday last, and last night I received a reply. He was very highly pleased with the sample of eggs, but said that the market had dropped very rapidly of late. Of this I was aware from watching quotations in the newspapers. He allowed me 30 cents per dozen for them and is willing to take more, although he said he cannot guarantee more than 25 cents for them. I am going to send him a thirty dozen case this week." Mr. Laidlaw states that he is very much obliged to me for having put him on the right track and so opening up a winter business for him, which certainly was the important point.

The next is from Mr. A. S. McBean, a well-known farmer of Lancaster, Ont. He says: "It is a little over a year since I first wrote you in connection with starting my poultry yards, and I have much pleasure in telling you that as far as I have gone I have been very successful. The information you gave me regarding the merits of the different breeds and the valuable pointers on poultry house construction has enabled me to show a model, small sized poultry yard, containing birds second to none in this section of the country. Although I have been away for my health the most of the year, still I am pleased with the success of my venture. During the early part of the winter and up to the middle of February I got 40 cents per dozen for my eggs. To the middle of March, 35 cents, and now, 31st March, 25 cents per dozen. Of course we are only shipping a small number now, as we are disposing of a number for hatching and are setting some ourselves. I intend getting a 200 egg incubator, and from what I can learn the Prairie State seems to lead. Would you please let me know your experience with this machine?" From the foregoing we infer that he is going in for the raising of chickens on rather an extensive scale. I will now read an extract from a letter received from a gentleman at White River, Ontario, addressed to Dr. Saunders. The writer says: "The advantage I gained from the report of your poultry director makes me very desirous of obtaining more information. The winter up in this section has been the coldest for years. The mean temperature of January and February represented three below zero, while March was only four above zero. Despite this fact your poultry manager will be rather surprised to learn that I have had Leghorn pullets laying since the 24th of December last year, which pullets were hatched the preceding May by incubator. I have no artificial heat in my houses which are built of logs and are banked up to the roof with earth like root houses. By the end of January I had twenty pullets laying and received from them for that month fifteen dozen of eggs. I think this is very fair considering climatic conditions." And so it is. The point is that White Leghorns in that cold region did remarkably well, I mention this because there is a general impression abroad that White Leghorns are not a suitable breed for cold winter portions of the Dominion. Mr. Bedford, our superintendent at the Experimental Farm at Brandon, informed me that he had found the barred Plymouth Rocks better winter layers. But a gentleman, whose name I forget, told me that his White Leghorns in the North-west gave the best results in a similarly constructed house to that described in the letter I have just read.

I shall next read a letter from Mr. T. D. Lowery, of Trenton, Ontario. He writes: "I have closed all accounts for the year and with a small flock, 45 hens. All feed was bought on the market and at a very high price, I find my fowls have netted me \$1.57 each. No fancy prices received for eggs or stock, everything being



sold on a glutted market. For good results I have to thank you and the reliable Poultry Journal. I trust the fattening station will not pass Trenton as there are a number interested in the cramming process here."

Here is a letter from a farmer in Glen Buell, to show the demand for thorough-bred eggs by farmers. He says: "I have only five Rock hens out of eggs got from you for two seasons. I bought a cockerel this spring, west, and hardly have an egg to set from them myself yet, as others want them faster than they are laid."

In connection with your novel experimental work in feeding, we carried on an experiment last winter, in accordance with the desire expressed by some members of the committee last year, to find out the difference in the number of eggs laid in winter by pullets and old hens. I may state that I laboured under the disadvantage that I had to use hens for hatchers and my pullets, as a result, were hatched at different times of the year. Had I an incubator I might have had all the pullets of the same age, and obtained in consequence a more exact and satisfactory experiment. But at any rate, I will state what I have learned, and I have learned some very useful results that I hope will be interesting to the country. A choice was made of eight White Leghorn pullets, eight Black Minorcas, eight Langshans, eight Barred Plymouth Rocks, eight White Plymouth Rocks, and eight Brown Leghorn pullets.

At the same time there was chosen of hens over two years of age, thirteen White Leghorns, seven Black Minorcas, ten Barred Plymouth Rocks, nine coloured Dorkins and eight White Plymouth Rocks. Some of these were two years old, some were three years and others between three and four years. But it was all the better for experimenting that the hens should be as old as I could get them. The pullets numbered forty-eight, the old hens forty-seven, the one year old hens twenty-two, being eleven White Leghorns and eleven Barred Plymouth Rocks, all I had of that age. The result of the egg laying was as follows:—From 1st December to 31st May the eight White Leghorns laid 538 eggs. They were hatched 11th of June, eight Black Minorcas laid 428 eggs, they were hatched on 9th and 26th of May. The eight Langshans laid 298 eggs, they were hatched the 15th and 16th of May and some later. The eight Barred Plymouth Rocks laid 648 eggs, they were hatched 30th of April and 24th of May. The eight White Plymouth Rocks laid 526 eggs, they were hatched on 25th of April and 9th of May, and the eight Brown Leghorns laid 481 eggs, the latter were hatched 17th May. The above shows that the pullets laid 2,919 eggs in the six months of high prices. The thirteen White Leghorns (two years and over) laid 503 eggs.

The seven Black Minorcas laid 436 eggs; the ten Barred Plymouth Rocks 489; the nine coloured Dorkings 312, and the eight White Plymouth Rocks 324—a total for the forty-seven hens of 2,064 eggs. The eleven White Leghorn year-old hens laid 556 eggs, and the eleven Barred Plymouth Rocks 522, making a total of 1,078 for the twenty-two.

EGGS LAID in Six Months by Old Hens, Yearling Hens and Pullets, as follows :—

Number.		December.	January.	February.	March.	April.	May.	Total for six months.	Remarks.
<i>Pullets.</i>									
8	White Leghorns . . . . .	41	106	90	84	98	119	588	Hatched 11th June.
8	Black Minorcas . . . . .	25	39	102	77	91	94	428	" 9th and 26th May.
8	Langshans . . . . .	4	35	42	55	62	100	298	" 15th and 16th May, and some later.
8	Barred Plymouth Rocks . . .	91	119	88	131	116	103	648	" 30th April and 24th May.
8	White " . . . . .	23	106	101	117	105	74	526	" 25th April and 9th May.
8	Brown Leghorns . . . . .	18	81	77	104	87	114	481	" 17th May.
48		202	486	500	568	559	604	2,919	
<i>Hens, two years and over.</i>									
13	White Leghorns . . . . .	40	50	32	91	130	160	503	
7	Black Minorcas . . . . .	49	40	47	84	96	120	436	
10	Barred Plymouth Rocks . . .	54	63	58	109	114	91	489	
9	Coloured Dorkings . . . . .	76	46	65	48	51	26	312	
8	White Plymouth Rocks . . .	15	18	45	77	80	89	324	
47		234	217	247	409	471	486	2,064	
<i>Hens, one year old.</i>									
11	White Leghorns . . . . .	83	38	83	106	131	115	556	
11	Barred Plymouth Rocks . . .	72	49	72	135	111	83	522	
22		155	87	155	241	242	198	1,078	

I have here a table showing the daily record of the eggs laid by the pullets during December, January and February, the months of high prices. I will not read the particulars, but if the chairman and the members of the committee will allow me I will put it in evidence :— *Vide table p. 224.*





## PRODUCTION OF EGGS BY DIFFERENT BREEDS, IN A GIVEN PERIOD.

*By the Chairman :*

Q. You might state now the net results.

A. The result of the laying during the three months of the highest prices as follows:—The eight White Leghorns laid 237 eggs; the eight Black Minorcas, 166; the eight Langshans, 81 eggs; the eight Barred Plymouth Rocks, 298 eggs; the eight White Plymouth Rocks, 232 eggs; and the eight Brown Leghorns, 176 eggs; a total for the forty-eight pullets of 1,188 eggs. One point I wish to draw attention to is this, that during the period mentioned frequently the eight Leghorns, the eight Barred Plymouth Rocks, and the eight White Plymouth Rocks laid sometimes five and six eggs per day. That is very good laying during the mid-winter season. We contend that fifty per cent of eggs in winter, when the prices are high, is as much as we can count on. But here, by proper food, care and housing we had frequently five eggs a day, on some days six, and on several days seven eggs from eight pullets, which is remarkably good laying.

## GOOD LAYERS.

To turn again to the first table there are certain deductions from these experiments that I think worthy of putting on record, in order that they should go to the farmers throughout the country from the committee. The early hatched Barred Plymouth Rocks laid most eggs when prices were highest, showing the benefit of having the pullets out early. The forty-eight pullets laid during the six months 855 more eggs than forty-seven hens two years old and over, but the eggs laid by the hens were larger than those from the pullets as shown by the eggs I have here with me. (Samples produced).

For example here is the egg of an Andalusian hen and here is the pullet's egg. There is an impression abroad, and that impression is perhaps warranted so long as eggs are not sold by weight, that it does not matter what the size of the eggs are so long as we get them in numbers. But I have always contended that the eggs of the older hens although smaller in number are larger in size and the specimens I have with me show that I am right. There is a considerable difference between these two eggs, as you see. The Andalusian hens are excellent layers,

*By Mr. Featherston :*

Q. Have you weighed a dozen of each of these?

A. I have. Andalusian eggs sometimes give six to the pound and at most times seven to the pound.

Q. Pullets, what do their eggs run?

A. About nine to the pound.

Q. Were the conditions the same as to feed, care and treatment?

A. They were. Here is the egg of the Leghorn hen and the Leghorn pullet. There is a marked difference. The difference perhaps is not quite so marked in the case of the Barred Plymouth Rock hen and pullet. There is this point to remember that the longer a hen lays in winter the smaller the egg is at the end of the season. These eggs were taken yesterday from our hen rack. The egg of the Plymouth Rock hen is not exactly as large as the egg would be at the commencement of the winter laying, say in November or December.

Q. Does the colour of the egg make any difference?

A. There is a preference for the dark egg in some localities, I may say in most localities.

*By Mr. Henderson :*

Q. Is it not a fact that in England the brown egg is preferred?

A. Yes, in the London market. In the Boston market the brown eggs will fetch two cents a dozen more. If you notice there is a great difference in the size of the eggs and when eggs are sold by weight, which I hope will soon be the case, it will be of importance to have large eggs.

*By Mr. Moore :*

Q. Do you think the large egg has as good flavour as the smaller one ?

A. A good deal depends on how the hens are fed. I have heard that there is a difference in flavour and in the quality of the egg, but I have come to the conclusion, from a long experience, that a great deal depends upon the rations upon which the hens are fed.

Q. If they are fed upon the same food you think the flavour will be the same ?

A. I think so, in most cases.

*By Mr. McGregor :*

Q. Do you use artificial heat in the hen house in winter ?

A. We have stoves in our hen houses, and I think stove heat is not beneficial. If the house is well constructed there should be no necessity for artificial heat in the winter time.

To return to our comparison between the laying of old hens and pullets we have another deduction, viz.: eight Barred Plymouth Rock pullets laid 361 eggs more than ten Barred and eight White Plymouth two-year-old hens. From twenty four pullets of the Spanish family, namely eight White Leghorns, eight Black Minorcas and eight Brown Leghorns the production was greater by 508 eggs than from twenty old Leghorn and Minorca hens of the same family during the same period. But the eggs of the hens were much larger. The eggs of the Brown Leghorns were very small. There was very little difference in the number of eggs laid by the yearlings and the two-year-old hens of the White Leghorns and Barred Plymouth Rock.

Seven three-year-old Black Minorca hens laid seventy-five more eggs than eight pullets of the same breed showing that there is some reason for the contention that hens of the Spanish family are good layers for three years at least.

*By an honourable Member :*

Q. What was the number ?

A. Seven three-year-old Black Minorca hens laid seventy-five more eggs than eight pullets of the same breed, during the same time.

Barred Plymouth Rock pullets were the earliest layers, they also showed the quickest development and laid the most eggs. The first pullet to lay was a Barred Plymouth Rock on the 7th November, 1898. This pullet was hatched in April.

#### COST OF FEEDING.

As to the cost of production in food we are trying to make it, in the case of pullets, ten cents a day and the same for the old hens. You may remember that experiments were conducted at your instigation two years ago by me, and it will be within the recollection of this committee that the cost of feeding fifty hens was ten cents per diem, and we tried to bring the ration down to the same price per diem in the case of forty-eight pullets.

*By Mr. Henderson :*

Q. Just at this point you told us last year that you had reduced the amount of food and had obtained better results by the reduction. Were there better results this time ?

A. Yes.

Q. You also expressed the opinion then that you did not think you had yet arrived at the minimum supply of food and the maximum of production in your experiments. Have you anything further to say on that point ?

A. I may say that we are all the time trying to reduce the quantity of food and the cost of the ration. If I can get the food which will give me the same number of eggs at less expense that is what I am trying to find. We have got the ration down to as low cost as we possibly can at the present time, but last year I was charged

a cent and a quarter per pound for wheat and the year before I was only charged a cent, so that my ration last year was actually cheaper by five cents per diem than the year before, but the increase in the price made it about the same cost.

*By Mr. McMillan :*

Q. I will just say here that I would like to know if you have made any experiments of this sort. Have you weighed the eggs of the different breeds of pullets and old hens so that you can give us information as to the weight of the eggs as well as the number produced and the quantity of food it required to produce them ?

A. I have not done so in this case, but it can easily be done.

#### ARTIFICIAL INCUBATION.

*By Mr. McGregor :*

Q. Do you like incubators ?

A. Yes.

Q. Have you tried them ?

A. Yes.

Q. And found them a success ?

A. Yes.

Q. And would you advise farmers to try them ?

A. Yes. With your permission I will show you by reading a letter how farmers are becoming more and more interested in artificial incubation, and how farmers have in many cases bought incubators and used them with great success.

Q. What is about the cost of a fair incubator ?

A. From \$16 to \$25.

Q. How many eggs would they take ?

A. The small incubator which costs \$15 to \$16 in Toronto, will hold sixty eggs. An 100 egg incubator will cost \$18 to \$22. They range from that capacity to 400 eggs, and higher prices.

*By Mr. Featherston :*

Q. Are the chickens from the incubator as strong as from the hens ?

A. Yes, they are.

Q. And do they seem to do as well ?

A. Yes. I have a letter here from a farmer near Montreal who says his incubator chickens are outstripping the other chickens. That is the general opinion of those who have tried both the natural and artificial methods of incubation.

*By Mr. McNeill :*

Q. How are the chickens attended to after leaving the incubator ?

A. We put them in the "foster mother" or "brooder," which is another little house, heated by hot air, where we keep the temperature for the first two or three days at 90 degrees, gradually lowering it to 80 and less as the chickens increase in size.

#### CHOICE OF BREEDS FOR PROFIT.

*By Mr. Semple :*

Q. What variety do you consider the best to keep on the farm in order to make a profit ?

A. Without any doubt the Barred Plymouth Rock. The Wyandottes are a good second and when you can get a good laying strain the light Brahmas. Some first crosses from these breeds do remarkably well, but the farmer will make no mistake in making a choice of the Barred Plymouth Rock as a good winter layer and a rapid flesh former. I can speak with no uncertain sound upon that point.

Q. What kind of Wyandottes are the best ?



A. There is no great difference. I prefer the White because they are a little blockier and plumper, and look, perhaps on that account, better for the table when dressed. I am not positive but that they are as good a fowl as the farmers can have.

*By Mr. Bell, Pictou :*

Q. Where do the Andalusians come in ?

A. They are an excellent fowl for egg laying. I have Andalusians that laid eggs in winter, which went six and seven to the pound, but they are nowhere as a market fowl. They are simply an egg producing machine, as are the White Leghorns and Black Minorcas.

#### WHAT TO FEED AND HOW TO FEED IT.

*By Mr. McGregor :*

Q. Have you anything to say for the general information of the farmers as to the feeding and care of fowl along the usual lines ? Have you got any hints to throw out before leaving the subject ?

A. Yes, sir ; our experimental work has proved that two rations per day will do much better than three.

*By Mr. McNeill :*

Q. Winter or summer ?

A. Winter or summer, particularly in the former season, when the fowls are artificially housed and fed.

*By Mr. McGregor :*

Q. You go in for mixed foods ?

A. Yes, but to take the place of the noon ration vegetables must be kept before the fowls all the time, as well as grit and oyster shells. These points have been described in my reports at length. We want to use in the morning as much of the farm waste as possible in shape of mash, and that is a matter of some importance to farmers. If you have plenty of vegetables, grit and oyster shells before the hens all the time our experience so far shows that they will do more egg-laying than if fed with grain at noon. It is necessary to their well being that laying stock should eat a quantity of green food. It is also an important factor in winter egg production. Grit and bone are important factors also. The fowls would not likely eat so heartily of green food and grit if they are fed on grain at noon. The afternoon ration should be fed early and thrown into the litter on the floor, so as to induce the hens to scratch for it. It is also a good plan after feeding the morning ration to throw a few handfuls of grain into the pens, so as to excite the fowl to scratch for it and so get the necessary exercise. There are three important factors in the winter feeding of fowls, viz. : Meat in some shape or form, green stuff and exercise.

Q. Do you feed the meat raw or cooked ?

A. I prefer to cook it.

Q. Is your mash mixed with warm water ?

A. Yes.

*By Mr. Featherston :*

Q. Have you used green clover for green food ?

A. We use lawn clippings, dried and put away in summer and steamed when we want them in winter. They come out almost as green as new grass, and the hens eat it with avidity. We feed it sometimes at 11 o'clock a.m. In fact we feed as much green food as possible.

Q. Where do you keep your lawn clippings ; you get them off the lawn ?

A. Yes. We put them upstairs after thoroughly drying them and store them for winter use.

*By Mr. Sproule :*

Q. Did you try cutting clover and feeding it to the hens?

A. Yes, we have tried cutting and mixing it in the mash, and good it is, too.

*By Mr. Featherston :*

Q. Do you use mangels?

A. Yes, we have mangels before the fowls all the time, and find them one of the cheapest and most wholesome forms of vegetable food. We use all the unmarketable vegetables and grains we can. We try to do nothing but what the farmers can.

*By Mr. McGregor :*

Q. Do you use milk?

A. Yes, sometimes.

Q. Mixed with the mash?

A. Yes.

*By Mr. Featherston :*

Q. Is there a possibility of the fowl getting too much to lay well?

A. Yes. The rations must be carefully fed. You will find one pound of mash to fifteen hens; or one pound of cut green bone to fifteen hens, and a little grain thrown on the floor immediately afterwards to keep them in exercise a good morning ration. No noon ration; but have plenty of vegetables, grit and oyster shells before the fowls. With the lawn clippings steamed and an afternoon ration of sound grain the fowls will not get too fat if fed in the proportions I have named.

*By Mr. McMillan :*

Q. Instead of grit could you not use ground granite?

A. That would do.

*By Mr. Henderson :*

Q. What do you suggest instead of oyster shells where they cannot be obtained?

A. A good substitute is old mortar or lime in some shape. Clover supplies lime in small quantities, and bone in the shape of beef's head, sheep's heads all broken up are beneficial forms in which lime can be given.

*By Mr. McNeill :*

Q. How much feed do you give to fifteen hens?

A. One pound of mash, one of cut green bone.

Q. How often is it fed?

A. Three times a week for the mash, and cut bone in the same proportion other three mornings.

Q. One pound of mash?

A. Yes.

Q. But you spoke about cut green bone?

A. Yes, in the proportion of one pound to fifteen hens.

Q. In place of the mash?

A. Yes.

Q. Do you use any clover?

A. Yes, sometimes in the mash, but lawn clippings are better.

Q. And you keep vegetables before the fowls all the time?

A. Yes, and we try to keep them in exercise by scattering a few handfuls of grain in the litter on the floor. Our object is to keep the fowls in exercise from morning till they go to roost. The idea is to make the hens fill their crops gradually and in the natural way. Such treatment and food prevent vicious habits, such as eating the egg and feather picking.

*By Mr. Sproule :*

Q. But where you give mangels or turnips you cannot keep it before them all the time without warmth to keep them from freezing ?

A. If your hen house is properly built, as nearly all poultry breeders build now, the animal warmth of the fowls will give quite enough heat.

*By Mr. McMillan :*

Q. Do you hang cabbage up ?

A. Yes, from two and a half to three feet in the case of heavy birds. With light breeds two and a half feet from the floor.

*By Mr. Bell, Pictou :*

Q. You mean that the lower end of the cabbage is three feet from the floor ?

A. Yes. It is hung up by the stalk. That is one way of exercising the layers and a good one, too. Sometimes we hang up a piece of tough meat, which I am sorry to say, is not very hard to get here.

#### PERCENTAGE FROM INCUBATION,—FERTILIZATION OF EGGS.

*By Mr. Erb :*

Q. A short time ago you referred to the breeding of chickens in an incubator ?

A. Yes.

Q. You have experimented in that direction ?

A. A little.

Q. And your experiments have been successful ?

A. Yes. Would you allow that to remain over for a few minutes ; I have some data of our own experience and from the experience of farmers that I think would be interesting to you.

Q. How many well-developed chickens do you consider to be a successful hatch from 100 eggs ?

A. Sixty per cent ; 75 per cent is an excellent result. I think the average results are 55 per cent.

Q. The reason I ask this question is that I read in your report last year that in one experiment you had one chicken, in a second two chickens, and next 25 chickens out of 100 eggs.

A. But that was with one incubator. There have been great improvements made recently in incubators, and they are now run with a degree of certainty that was unknown even last year. We had an incubator last year and it was not a success.

Q. Can you tell me the name of that machine ?

A. It was a Prairie State incubator. Let me explain my method of trying an incubator. I have a man who assists me, a practical farmer, for he has a farm of 200 acres in Cumberland which he worked. I say to him "I am going to hand you over an incubator to operate, I wish you to handle it as a farmer would." I carefully read him the instructions and see that he understands them and how to operate the machine. I see that the instructions are carried out. With the machine we have this year we got out sixty chickens from ninety eggs. It is the Cyphas incubator, which is made by Mr. C. Cyphas, who is a leading authority on artificial incubation.

Q. Did you have the same man use this as the other ?

A. Yes ; I should have mentioned that. I simply placed it in his hands and told him to see what he could do with it. I happened to be at the institute meeting in North Hastings for two or three days at the critical period, from the 18th to the 21st day, and he got sixty chickens out of ninety eggs.

*By Mr. Henderson :*

Q. Was that early in the season, before the snow went off ?

A. No, we did not get the incubator till spring. I may say that spring eggs hatched badly all over the country this year.



Q. Do you think there is anything in the theory that thunder kills the chicks in the eggs?

A. No.

*By Mr. Sproule :*

Q. Would there be anything in your eggs not being properly fertilized?

A. Yes, sir; that is probably the main cause of poor results. The general complaint throughout the country last spring was small hatches, and the probable cause was that the eggs are not properly fertilized, owing perhaps to the late and cold spring.

*By Mr. McGregor :*

Q. What is the best incubator, and how is it heated?

A. I found the Cyphas gave the best results. Hot air is used to heat it with. At this point will you let me read a letter from a gentleman in Sussex, New Brunswick. Among the questions asked me by this gentleman, when addressing a meeting in Sussex, was, which was the best incubator? I recommended him the Cyphas, and this is what he says: "I have hatched out by the Cyphas incubator, a 220 egg machine, 162 chickens. This is the first experience. The chicks are now two weeks old, and what I want to know is how I can guard against disease?"

*By the Chairman :*

Q. What is the date of his letter?

A. June 12th, 1899.

*By Mr. Erb :*

Q. What are the results of your own personal experience in the use of incubators?

A. Well, as I have said we tried our incubators as a farmer would try them. We had a Prairie State last year and the Cyphas this year. The most we could get from the one was 40 per cent, and this year out of the other, the Cyphas, we got 66 per cent, and here is a man (whose letter I have just read you) who, at the first time of trying, gets 162 chickens out of 220 eggs with the Cyphas.

*By Mr. Henderson :*

Q. Why didn't he get more, what was the cause of it, eggs not fertilized?

A. I presume partly from that cause. Perhaps in some cases the germs were weaker than in others. His stock may have been old or may have been over fed. There are a great many conditions which would affect the germs.

*By Dr. Sproule :*

Q. Have you no particular food that you could feed for the purpose of increasing the fertilization?

A. We found the less breeding stock are fed, so as not to prevent egg laying, the better. We keep the male birds by themselves, because we found that when the males are allowed with the hens which are being stimulated to lay in the winter, they (the males) become over fed and are often ruined for breeders. In many cases they die before spring from fatty degeneration of the liver or other result of overfeeding.

*By Mr. McNeill :*

Q. Do you think from your experience that an incubator is a better hatcher than the old hen?

A. We have not enough data to tell decidedly, but, so far as results obtained from the Cyphas incubator show, it is a more comfortable and economical way of

raising chickens than by the old hen. I am shaping so that by next year, if I am alive, I will be able to submit some further information upon this point.

Q. Where is this incubator made?

A. In Wayland, New York State, there are two or three incubators made in Canada which are good. Mr. Baldwin, of Toronto, hatched out 100 chickens from 100 eggs by incubator.

Q. What incubator did he use?

A. It is a Toronto incubator, made in Toronto. Mr. Yule, of Aurora, Ont., hatched ninety-six chickens out of 100 eggs with the same machine. The Safety incubator made by Mr. J. E. Meyer, of Kossuth, is another good machine.

*By Mr. McGregor :*

Q. Is there any way of testing by examination the fertile eggs?

A. Yes. An egg tester comes with each machine with instructions how to use it. About the sixth day the eggs are tested and all the clear ones removed, leaving only those that show any cloudiness or appearance of development, on the eleventh day they are tested again when the condition of development is more pronounced and it is easier to detect the good or bad eggs.

*By Mr. Semple :*

Q. How long does it take to hatch them in the incubator?

A. The new laid eggs will hatch in an incubator on the night of the twentieth day. The same as under a hen.

*By Mr. McMillan :*

Q. Are not the eggs from hens which have their liberty running around the farm better for hatching than those from chickens that are kept penned up?

A. Undoubtedly. The eggs from hens running at large are certainly more apt to be fertile than those from hens which are confined to limited quarters or that lay well in winter and lead an artificial life, and very certain to be so, where there is no exercise.

*By Mr. Henderson :*

Q. You think that is the reason why the late eggs are more likely to prove fertile than the winter eggs?

A. I do. We have been endeavouring and I may say have been successful in our efforts to get our hens to lay in the winter time. We have got 568 eggs in November and 1,500 in December, when the prices were from twenty-five to thirty-five cents a dozen. We tried to get our eggs then because they are higher in price. But we had to have our laying stock in proper condition.

*By Mr. Moore :*

Q. You cannot tell whether an egg is fertilized or not until you examine it?

A. No, only when it has been under the hen or in the incubator six or seven days. Some experts can tell at the end of the fourth day.

#### THE FATTENING OF CHICKENS.

During the months of October and November of last year an interesting experiment was conducted in the poultry department of the Experimental Farm in the fattening of thirty-six chickens composed of the following breeds, viz.:—

Eight barn-yard chickens which were purchased from a neighbouring farmer at forty cents per pair. Their average weight was three pounds each, and they were perhaps a little better than the ordinary scrub so often found on the market.

Four cockerels of the Light Brahma Buff Cochin, first cross bought from a farmer at fifty cents each. They were fine large birds weighing respectively six pounds thirteen ounces, six pounds nine and a half ounces, five pounds ten ounces and six pounds three ounces. They were probably hatched about the same time as the first named group but were nearly double their weight, going to show that the nearer the large thoroughbred flesh forming types the crosses are, the better the birds.

The remaining fowls consisted of Barred and White Plymouth Rocks, Light Brahmas, Silver Laced and White Wyandottes and four White Indian Game White Java crosses. The birds were from our poultry department and were fine specimens some of the Plymouth Rocks and Light Brahmas weighing six and six and a half pounds each.

The chickens which were divided into nine groups of four each were placed in suitable fattening pens with narrow trough in front in an upper compartment of the main poultry building. They were fed morning, noon and afternoon with regularity on rations composed of:

- Two parts finely ground oat meal.
- One part finely ground barley meal.
- One part ordinary ground corn meal.

After the fifteenth day beef suet, in proportion of one ounce to the group, was added to the ration.

The whole was mixed with sweet milk made hot. Of these rations the birds were fed all they could eat. No forcing machines were used.

Full particulars of the experiment are given in my report recently placed in your hands, and which I trust will be found equally interesting and instructive. I need not repeat all the details but the following will show the weights of certain chickens before and after fattening.

Group two was composed of four barn-yard chickens which went into the fattening pen on 31st of October weighing 14 pounds 5 ounces, and at the end of five weeks weighed 20 pounds 8½ ounces, showing a gain in that period, 6 pounds 3½ ounces.

Group No. 8 was composed of four Barred Plymouth Rock chickens weighing 23 pounds 12 ounces, when they went into the pen. At the end of five weeks they weighed 30 pounds 4 ounces, making a gain in that period of 6 pounds 8 ounces.

The barn-yard chickens were apparently of the same age as the Plymouth Rocks (May chickens). The barn-yard chickens consumed during the five weeks food to the amount of 36 pounds and ¾ of an ounce, and the Plymouth Rocks consumed during the same period 37 pounds 1½ ounces, showing that the Plymouth Rocks consumed one pound and three-quarters of an ounce more food.

Valuing all the grain food at one cent per pound the average cost of one pound of flesh increase in both cases was seven cents. The above shows that the Barred Plymouth Rocks both before and after the fattening were much the heavier fowl.

Four White Plymouth Rocks weighed at the end of five weeks thirty pounds and a half an ounce.

Most satisfactory results were obtained from the four chickens of the Light Brahma Buff Cochin cross. They weighed on going into the fattening pen 25 pounds 3½ ounces, and after five weeks they weighed 33 pounds 6½ ounces, being a total gain of eight pounds three ounces, and the consumption of food during that period was 39 pounds 7¾ ounces. I estimate the cost of production per pound in that case at about six cents.

In connection with the foregoing there are certain points which make themselves evident, and which are important enough to warrant my bringing them to your notice and to let it go out to the country.

1. In poultry fattening it is very much a question of breeds.

2. If the rapid flesh forming breeds such as the Plymouth Rock, Wyandottes, Brahmas and Cochins are kept by the farmers of the country and are properly cared for and properly fed for three or four weeks previous to being killed, no "forcing" or "cramming" process by machine will be necessary to produce the superior quality and quantity of flesh desired for export to English markets or for home consumption.



3. That the ordinary barn-yard chicken does not make as satisfactory a market fowl as the Barred Plymouth Rock or other thoroughbreds. For instance we find a barn-yard fowl No. 8 in our experiment weighing four pounds six ounces while Nos. 25 and 26 Barred Plymouth Rocks of same age and with same treatment weighed nine pounds and seven pounds respectively. The Barred Plymouth Rocks showing more than double the weight of the scrub. A very important difference.

*By Mr. McMillan :*

Q. Were the birds put away from the other chickens?

A. Each bird was in a small pen by itself, isolated entirely.

4. The aim should be to choose such foods and adopt such treatment that flesh will be made rather than fat. Experience has shown that birds penned up in limited quarters and fed all they can eat without opportunity to exercise are inclined to put on fat rather than flesh.

It is quite possible that in the case of scrubs or ordinary barn-yard non-descripts, to be found in such numbers on the markets, that the "forcing machine" or "crammer" may be used to good effect, but our advice to the farmer is to abandon the scrubs, which experience has shown to be neither good egg producers nor heavy weight market fowls, and to take to those thoroughbreds which are good winter layers and rapid flesh formers. Our farmers want fowls that are good winter layers and heavy flesh makers and they can have them in the Barred Plymouth Rock, Wyandotte and Light Brahma. It is genuine matter for congratulation that our instruction and advice are being widely acted upon, as the letters I have read go to prove. It has been my aim, since coming to my present position, by both pen and voice to bring the fact prominently before the farmers of the country that it costs no more to produce the good winter egg laying, thoroughbred hens or rapid flesh making thoroughbred cockerels than it does to rear the non-descript, which is in most cases a poor layer and equally unsatisfactory as a market chicken.

5. Our experimental work proves my contention to be correct. The fact stands prominently before the farmers of the country that if we are to capture the British market with a superior quality of poultry, and we can undoubtedly do so, it must be done with thoroughbreds and not scrubs.

While on this subject of flesh *versus* fat, I beg to read part of my evidence before your committee in 1896 on the subject of proper feeding of poultry by the farmer, which will show you that the feeding of poultry so as to obtain flesh rather than fat is one that I have been studying and agitating for many years past. The extract reads :—"It may not matter so much to the man who is selling what he has his weight in, but it is a matter of some moment to the purchaser whether he gets his weight in flesh or fat. Fat would be so much waste. It is important to ascertain, if possible, which are flesh rather than fat producing rations."

In connection with this subject I may say that I had a long conversation with a gentleman Prof. Robertson sent to me, Mr. Crane, an English expert in the rearing, killing and dressing of poultry for the London market. He said that the fowls fattened by cramming machines were not so much sought for in London as formerly, that the birds now most asked for are hand-fed Surrey fowls of large proportions and carrying as much flesh as possible. The following extract from an article on "Specially Fattened Poultry" by Mr. A. F. Hunter, a practical poultry breeder on a large scale and the editor of *Farm-Poultry* of Boston, one of the leading poultry journals in America, will be interesting at this point. I may say that Mr. Hunter spent many months in England, France and Belgium the year before last studying the fattening of poultry in the different countries named. Mr. Hunter says :—

"For our American markets we are of the opinion that the half-fatted fowl is the best, for the reason the bird that has been finished off by the cramming process is very rich, the flesh being quite equal to that of the capon; indeed it is too rich for most palates, and would only be used where a small slice of fatted fowl (or capon) was served as one course of an eight or ten course dinner. If the ordinary family sat down to roast-fatted fowl, that fowl being the principal dish, as is the joint of beef

I do not say that the cravanning method cannot be used to good effect particularly in the case of barn-yard fowls. But past experience warrants the opinion that very

little forcing, if any, is necessary in the case of thoroughbred Plymouth Rocks, Wyandottes, &c., and it is for experiment yet to decide whether the gain, if not in all, at any rate in many cases is not in fat rather than in flesh.

I should like to say something before I close on artificial incubation, but as that subject has been gone into pretty thoroughly, perhaps, it is only necessary for me to say a very few words.

*By Mr. Henderson :*

Q. Before you leave this branch I do not think you took in my question regarding the experiment in feeding. You said last year you had reduced the ration one-third and that then you had reached the minimum ration or the maximum egg product. I desire to know with regard to eggs whether you have further reduced the ration and increased the product?

A. We have not reduced the ration to any appreciable extent.

*By Mr. McGregor :*

Q. Do you let the chickens out daily?

A. Yes, the chickens are penned up with the mother hen and allowed to run.

Q. I mean your laying hens in fall and winter. Do they run out?

A. Yes, they run out. After we break up the breeding hens we put the male birds in a separate building and let all the hens run in the fields and in rear of poultry buildings.

*By Mr. Rogers :*

Q. The increase in weight was seven or eight pounds?

A. Yes.

Q. What is the average price received for the fowl?

A. That would depend on where the fowl was sold. A good pair of fowls, of the description I have read, sold in the market here for \$1 a pair.

*By Mr. McGregor :*

Q. The great advantage would be that you improve what you have?

A. Yes. A chicken that is thin is worth only five or six cents a pound, whereas a fat chicken is worth ten cents a pound. The fattening experiment was conducted with a view of gaining a superior quality of flesh to send to the English market of high prices.

Q. Is the cost per pound based on the increased weight you gained while feeding?

A. Yes, on the increased weight. The gain seems to be much the same in all breeds, perhaps it may vary a little in some cases.

*By Mr. McMillan :*

Q. What is your experience with regard to the crossing of thoroughbreds: do you think it is an advantage?

A. I think so in certain cases, but there should be some method in crossing. You should cross a breed with large breast development with a breed that is lacking in that respect. The same with other points. There should be a method in order to obtain satisfactory results.

Q. Can you tell me if a farmer has limited accommodation for one or two kinds of fowls only, is it better to keep a fowl like the Plymouth Rock, which is a fairly good layer and flesh former, or would it be better to keep another line for egg laying?

A. I think that the best plan for our farmers to pursue would be to keep a breed which will make good winter layers for the winter market, particularly if he is near to a city, and a breed which is also a good flesh maker for the market. The best kinds for the purpose are the Plymouth Rock, the Brahma, or the Wyandotte.



Q. Which of these do you recommend for egg producing—the Leghorns or the Minorcas?

A. I would prefer the White Leghorns, in any case, as layers. They are not only our best layers, but lay the largest egg.

*By Mr. Sproule :*

Q. How are the Black Spanish for layers?

A. They are very good, but I think the White Leghorn is better.

Q. I thought the Black Spanish laid a larger egg than the Leghorn?

A. The difference is very slight. And now, gentlemen, I would like to close, but before doing so——

The CHAIRMAN.—Do not hurry.

Mr. MCGREGOR.—I do not think there is any department of the farm more important than that of poultry.

*By Mr. Henderson :*

Q. Would you give me the best suggestion you can to prevent the hens from eating their eggs? They are sometimes addicted to it?

A. I have successfully cured our hens of eating their eggs by supplying them with the food, the lack of which we thought was the cause of the vicious habit. We found that idleness, lack of exercise in winter, lack of animal food in some shape, of green food, the non-supply of all the little essentials so necessary to the successful producing of eggs in winter, were the prime causes.

Q. Keep them in good health?

A. Imitate the natural conditions as much as possible. The hen when outside supplies herself with all that goes to make the egg and the shell, with grit to grind up her food and what is required to keep herself in good health. In other words, I try to imitate in the artificial treatment of the hen the natural conditions, and the nearer I come to it the greater is our success.

*By Mr. Rogers :*

Q. The only way—one way to cure them from eating their egg is to?

A. Cut her head off? That is the most effective. Another method is to cut the lower mandible. But there are nests made now by which it is possible to detect the egg eater.

Q. Knitted nests?

A. Some may be, but I mean a nest in which the hen goes in to lay and she is kept there till released.

*By Mr. McNeill :*

Q. So that if she eats her egg you will find it out?

A. Yes. There is also a nest made in which the egg after being laid disappears, so that the hen cannot eat it, but they have never been very effective. In some cases the hens have avoided them and laid on the floor.

Q. Do I understand you to say that they cut off part of the lower mandible?

A. Yes. So that they cannot close the beak.

Q. Won't that prevent them eating grain?

A. No, it does not.

Q. Would not that interfere with the feeding?

A. No, you would not cut it to such an extent. As a rule egg eaters first peck at the egg. An evident object is to get hard shells which will make as much resistance as possible. I do not think it matters whether the upper or lower mandible is cut.

## BROODING HOUSES WITH ARTIFICIAL INCUBATION,—MARKET PRICES.

Permit me now for a moment or two to call your attention to the subject of the artificial hatching and rearing of chickens by incubator, and brooder, or in brooding houses, and which is becoming so much in vogue, as some of the letters I read at first go to show. To the specialist incubators and brooding houses are indispensable. The farmer may be slowly, but he is surely realizing the necessity of having his chickens out as early as possible, and at the same time. The chief complaint of the farmer is that he cannot get early pullets, so as to have early layers, because his hens do not sit early. No doubt the principal cause is due to his hens not laying in winter, but with an incubator and fertile eggs—which he certainly ought to have in March or April—he should be able to bring out all the chickens he will require in one or two batches. Incubators are now made to operate simply with no trouble and almost with a certainty. The following letters will prove my statement. Mr. Kinnear, of Sussex, N.B., whom I quoted before, says in a letter: "Would you be kind enough to tell me at what age chicks are subject to the disease called gapes and the remedy therefor. I have hatched out of a Cyphas incubator (220 egg machine) 162 chickens, now two weeks old, and I want to know what to guard against in the way of disease." I have been told by Mr. Evans, of Kingsey, Que., that he hatched 55 of 120 eggs by incubator. His first time, which is very good. Mr. Allan, of Carleton Place, hatched out 50 or 60 chicks out of the same number of eggs. It was also his first attempt, and that also was very satisfactory. It must be understood that incubators are now much improved and are much better than ever they were before. They have been for some time beyond the experimental stage. There are concerns in the United States in which there are tens of thousands of dollars invested, and these joint stock companies depend upon incubators for their dividends. In some cases they have 20, 25, 30 and even 40 200 to 400 egg incubators at work. They trust entirely to these machines and to their brooder house to hatch and rear their chickens, and so make their money.

You can readily imagine that they have not gone into these enterprises for fun, but with the prosaic aim to make money, unless they make money they will drop the business. A large enterprise was started lately in Toronto, viz.:—The Toronto Poultry and Market Garden Produce Company. I had the pleasure of visiting the farm in the latter end of April. They had started operations in poultry raising only during February, and when I was there they had hatched altogether by incubators, 900 chickens and expected four or five hundred more very soon. They had incubators hatching out every day. In such a case, or where a number of incubators are hatching out daily it does not matter whether one incubator gives forty or fifty per cent. They get a large number in the aggregate of chickens every day. The man experimenting with one incubator, if he does not meet with success, hears a good deal about it. But if he has thirty or forty at work, it does not matter if two or three do not produce good results. But it makes it all the more important to a man who has but one machine, that he should have a reliable one. And that is the object with which we are conducting our experimental work now, to find out the most reliable.

*By the Chairman:*

Q. Where does this Toronto firm get their eggs?

A. They have their own hens on their premises. They intend to put up this year 360 foot poultry houses.

*By Mr. Featherston:*

Q. Is that the firm just east of the Don?

A. Yes, sir.

Q. That is the firm that does the duck fattening?

A. No, that is another. That is Thompson's duck fattening establishment. The establishment I mean is the Toronto Poultry and Garden Produce Company.

It is a new firm with a large poultry plant. There are two or three other plants now going up. Success is just a matter of skill and management. The Toronto poultry establishment is in charge of an expert, Mr. J. M. Wilson, and he undoubtedly will make a success of it.

Q. I have seen the ducks fattened by Mr. Thompson and it is surprising to see them. Their feathers lie so smoothly. They looked fat and heavy and inviting when I saw them?

A. They are all hatched by incubators.

Q. Do they castrate their drakes?

A. I cannot say. That is something like caponizing chickens. Capons are rather too expensive and I do not think with our heavy breeds that they are necessary. I am told that Thompson's ducks cannot be supplied in sufficient quantities to supply the local demand.

Q. Parkes Bros. sold them for one dollar a pair?

A. In Boston they sell for thirty-five and forty cents a pound in season. In a conversation I had with Mr. Hunter, he showed the possibility of making money in poultry by producing broilers, if one is expert in making the product. He said: "You are content with a dollar and a half or two dollars profit per annum per hen. I want four and five dollars per hen profit, and do you know how I calculate to get it? You get a dozen eggs in January and sell them for thirty or thirty-five cents a dozen. I hatch out the dozen eggs in my incubator, and say I only get six chickens, which I sell at a dollar and a half a pair, less the cost of rearing the chickens; you get thirty cents."

Q. But that is in big cities?

A. That is in big cities, but just now Canadian poultry is in just as great demand as the ducks we have been talking about. Despite the intervening duty, I have been told that both eggs and ducks have been sent to the Boston and New York markets and with profit to the producer. We aim to produce the superior quality for the high price market, I do not care where.

*By the Chairman:*

Q. Have you visited any of the successful American institutions of that kind recently?

A. No, but I have met some of the successful operators and they have just told me what I have been telling you; that their incubators are certainly far beyond the experimental stage, and their results satisfactory.

You heard Mr. Robertson tell you recently that some man in England was making \$5,000 a year by fattening chickens. The men in the United States are making equally good sums by putting on the market early broilers worth a dollar and a dollar and a half per pair. I went to Montreal some time ago to inquire into the requirements of the trade and the dealers told me they had no poultry of the quality their customers wanted and that they would willingly pay a dollar to a dollar and a half a pair for early broilers. The manager of Brown Bros. told me that, and for a good quality of poultry later, ten cents per pound.

*By Mr. McNeill:*

Q. What would that mean, what month?

A. Chickens hatched in January and properly cared for and reared so as to reach the market two months and a half old would fetch a dollar and a half per pair. Early broilers one dollar and a half, later on a dollar per pair and the price keeps decreasing until the hen hatched chickens come into the market.

*By Mr. Featherston:*

Q. Is that Brown Bros. of St. Catherine street, Montreal?

A. Yes. There is also Mr. Harry Gatehouse and Mr. Lamb of Lamb's market. The latter said he would give me nine and a half cents a pound for two or three



tons of poultry if I could get it at that time for him, early summer. The point I wish to bring out is that by artificial incubation you can get the early chickens which bring a high price. I do not mean to say that the farmers should take to artificial incubation at once although like Mr. McBean whose letter I read, some are doing. I would have them raise by ordinary methods a superior quality of poultry. When I go among the farmers, I find that a great difficulty with them is to get early pullets, so as to have early layers when the old stock are moulting and eggs are worth twenty-five cents a dozen. I wish I had a letter here from Mr. Collingwood, the managing editor of *The Rural New Yorker*, to read to you. It would show the interest taken in having early layers. Mr. Collingwood wanted to know how we managed in our department. Farmers must realize that in order to have satisfactory returns they must adopt business like methods. They must have their hens lay in winter and have early and a superior class of chickens for market. A market gardener offers no excuse for not putting his product on the market at an early date. His aim is to get his green stuff on the market early by means of hot beds. The farmer may use his incubator with the same object in view. The American poultry firms place their products on the early market and receive the highest compensation.

*By Mr. Rogers :*

Q. Will not cold storage warehouses equalize prices?

A. They have not done so yet. It was feared that they would do so, but so far the winter price of new laid eggs has not been affected in Montreal.

*By Mr. Featherston :*

Q. Nor the early chicken trade, I think?

A. Nor the early chicken trade either. The early chicks are the product of skill and energy. Many try and few get there. As affairs are at present the farmer does not seem to try to get even a superior quality of hen hatched chickens, and he will not do so until he keeps the breeds which make the large and superior birds. As I have already said if he will only take to the Plymouth Rocks or Wyandotte, rather than the scrub he would have, at the end of four months, chicks weighing eight pounds per pair. Such chickens as would find ready sale in England at high figures and paying prices on the home market. But it is evident that the farmers must first produce the quality before they can expect to get good prices. As showing the good results of a farmers' institute meeting, I may say that a farmer who rears superior chickens, not far from Ottawa, told me they had never heard of Plymouth Rocks until I went to their institute meeting four or five years ago. I laid the matter before meetings of the institute in North Lanark. In fact I talked it up repeatedly and the result was that Prof. Robertson obtained from near Carleton Place the chickens which were put upon the English market so successfully, not long ago.

*By Mr. McNeill :*

Q. At home we killed a pair of chickens of a cross between a Game and Plymouth Rock. A large Game cock was crossed upon a Plymouth Rock hen, and at the age of three months they went eight pounds to the pair.

A. Mr. W. C. Caldwell informed me, when I was in Lanark, that his son had got nearly the very same results from a Plymouth Rock and Brahma cross. When I was at the farmers' convention at Fredericton, N.B., the year before last, I happened to mention some of the chicken weights, when a farmer got up and said, "I can discount that, I can get eight and three-quarter pounds on a pair of chickens in three months." I said, "you have thoroughbreds," "I have," he said, "a cross of Buff Cochin and Brahma." I have made it a point, whenever before this committee or at farmers' institute, to underestimate rather than overestimate in my statements. I have been now for nearly twelve years giving instructions to the farmers, and I have not yet had to retreat one jot from the stand I first took in regard to breeds best for the farmers. Recently Mr. David Moir, president of the North Lanark

Farmers' Association, said to me: "What we like about your position is this, that you have never had to take back one statement in regard to poultry matters. What you have said to us in the past years' experiments, in your own and the hands of other people, have demonstrated to be correct. You have always recommended to us what recent shipments have proved to be the best fowls for home consumption or shipment to the foreign market, or winter layers." To-day I repeat the statements to you.

*By Mr. Sproule :*

Q. It would be no use telling fish stories in such cases?

A. No, not to farmers.

*By Mr. Henderson :*

Q. Is it possible you are so wedded to these special breeds that you cannot make up your mind that anything could be better?

A. You know what the school boy said, "experiadented" does it, and so it does. I got my experience many years ago as an amateur. At that time we were putting chickens upon the market here when few people had them. We were also having eggs in winter when they were almost an unknown quantity, and the prices very high.

*By Mr. Featherston :*

Q. Have you heard anything about the firm of King & Co. who killed so many turkeys last year and shipped them, many thousands of them?

A. Yes. The firm seems to have done well. I was at Lindsay a year ago last December, and I was told it was simply impossible to get the number of turkeys required by the local firm for shipment. When the proposed fattening stations are established and the requirements of the English market thoroughly understood by our farmers, there will no doubt be a great demand for the breeds which make the large and fleshy birds. When I went among the farmers at first, I think they looked upon me as a sort of Baron Munchausen when I told them about the winter prices of thirty, thirty-five and forty cents per dozen for eggs. I said, "if you do not believe me, try the Montreal market which you can reach." In many cases I got farmers to go to that market, as McBean's and Laidlaw's letters show. The result is they have new-laid eggs (in winter) in Montreal in abundance. Our farmers, by producing the superior quality of poultry, which they can readily do by keeping such birds as I have recommended, can and will capture the British market. I beg to read some figures which will show what prices are paid in London, Eng. I read from the report of an English expert "that no chickens should be sent to the London market over six months old and under three and a half pounds live weight." He thinks that chickens of good table sorts ought to weigh six pounds in five or six months. I have shown how easily you can attain these weights with our thorough-breds and certain crosses. The high figures paid are shown by the monthly quotations of wholesale prices for chickens as given by Messrs. Brook Bros., Leadenhall Market, London, England, 1896:—

	s. d.	s. d.	
January.....	3 0	to 4 0	each.
February.....	3 0	" 4 0	"
March.....	3 3	" 4 6	"
April.....	4 3	" 5 0	"
May.....	4 0	" 5 0	"
June.....	3 8	" 4 3	"
July.....	3 0	" 3 6	"
August.....	2 3	" 3 0	"
September.....	2 6	" 3 0	"
October.....	2 6	" 3 0	"
November.....	2 6	" 3 0	"
December.....	2 9	" 3 3	"

It will be seen from this schedule that you get good prices until June, but from that month until December the prices are down. Now what does four or five shillings paid in the London market for chickens mean? It simply means a price that our farmers do not dream of. Here is a market within their easy reach. It is for our farmers to produce the superior quality which that market demands. The question arises, is the genius of the people equal to their opportunities? and I say that certainly it is. The response made to Professor Robertson's demand for the production of a superior quality of poultry and which came from North Lanark is the answer.

*By Mr. Erb :*

Q. What reason induced you to purchase a Prairie State incubator in preference to the other?

A. Because it was the best machine on the market then.

Q. It was only two years ago, your experience with it was not satisfactory in one year's trial and yet in one year's experience you claim that the Cyphas is superior to the other. The reputation which the Prairie State has obtained throughout the country leads one to believe that they give satisfactory results, to the parties who use them?

A. Undoubtedly they do. I do not mean to belittle them. My machine might have been a poor one.

Q. It may be in the attendance?

A. No machine should require to be nursed. The machine was used in the same way as a farmer would use it. Let me again explain that when we get a machine I put it in a room at end of the main poultry building. I call my man and read the instructions to him, and tell him to take it and run it accordingly to those instructions the same as any farmer would do. My man is as intelligent as the average farmer, and if he can't run it with the instructions accompanying the machine, how can a farmer run it?

Q. But, if other people find it a success?

A. Well, will you allow me now——

*By Mr. Henderson :*

Q. I think I see the difference between you. This gentleman may be taking the results from eggs laid, say in the month of May, or, June when the probability is that nearly every egg is fertilized, while the other may be giving the results of experiments with early eggs which were not fertilized?

A. That is very true, and to a certain extent to the point, but I am inclined to agree with what the honourable member says, although he is apparently making a point against myself when I say so. I hope he does not think, I wish for one moment to decry the Prairie State incubator. There may be some fault in the machine. I am simply giving the results as I found them. One locomotive is often a better running machine than another, although both are made alike, and made by the same firm. I am going to try and get the machine changed, and get one of the same size as the Cyphas machine I have.

Perhaps the following letter I received from the member from St. Anne's division of Montreal will show that I am perfectly impartial. I may explain that Mr. Quinn came to me and said he had ordered an incubator and asked to get the eggs. He told me it was a Prairie State. I suggested for the first attempt cross-bred eggs and he requested me to get them for him. I did so, and sent them to him by express. He writes: "My hatch is over, and has been a great success for me at any rate. Here is the result. Total number of eggs 100, first examination gave me an approximate of undoubtedly fertile of about 60, doubtful 35, not fertile 5. Actual results, not fertile 10, died during incubation 10, healthy chicks 69, diseased chicks 11. You will see by this that I have every reason to congratulate myself. The 69 are absolutely without blemish. The 11 may gain strength, but I doubt it."



You see that is a great deal better than I did with the same make of incubator, the Prairie State.

*By Mr. Erb :*

Q. Then I do not think the statement you made that there is a great improvement since you got your machine is a fact.

A. The question really is one of pattern. Mr. Quinn may have improvements we had not. I presume the company would be perfectly willing to change the machine I have. But meanwhile I have to go by what results I have got.

Q. You are just giving the result of your own experience ?

A. Certainly. There is a difference between the machines and it may have to do with the different results. The Cyphas does away with the vexed question of moisture. The Cyphas instructions are different from most of previous ones. For guidance Cyphas says in so many simple words, "Fill the machine with eggs. Set the regulator at 102½. Turn the eggs twice per day and leave the machine alone." The other says you must closely and frequently examine the air space in the shell in order to determine whether moisture is required or not. The difference is at once evident. In one case (the Cyphas) you have no anxiety. In the other undoubted trouble and possible error. It is not said how much moisture to supply but you are to find out what is required from the condition of a space in the egg which to judge correctly requires (it is admitted) a certain amount of expert knowledge. The Cyphas does away with all that. If one machine is more simple to operate than another that is what I am trying to find out and give to the farmers of the country. I do not wish the honourable member to think for one moment that I came here for the purpose of decrying the Prairie State machine. I think the honourable member means that perhaps we were not as careful in attending to the Prairie State as the other, but I can assure him it is not the case. We give just as much care to the one as we did to the other.

Q. I have no interest in any machine.

A. I know that, nor have I.

Q. What I was pointing out is that it is a wrong principle to form a conclusion on the experience of one man and one machine, and to base a statement on these two single experiments and say one machine is superior to the other. There may have been other people that have had as good success with the Prairie State as with the other.

A. I have just read Mr. Quinn's letter to show you how successful he has been with his Prairie State. You could surely not wish for a better testimonial. You said that you read in my report that I had made three trials of the Prairie State. Surely that is enough to warrant me in coming to a conclusion.

Q. Possibly the very next attempt with this new machine might be a failure.

A. Yes, but I am justified meanwhile in coming to a conclusion when my first attempt with one machine gave me 60 per cent and after three attempts I cannot get more than 40 with the other.

*By Mr. Hurley :*

Q. I live near Mr. Jarvis, poultry manager at Guelph. He has had a great deal of experience with incubators made in the United States and Canada. Some of them show better results than others. A good many farmers in our district have dropped having private incubators. The way they do now is to take the eggs to a neighbour and have them hatched out on shares. I have seen it done this spring. There is a man near us who has been quite successful in hatching out on shares; the farmers take the eggs to him in a basket, and they bring the chickens back when they are hatched out. I think it would be a good thing for farmers to appoint one of themselves, one who has time to do it?

A. They are doing the same co-operative work in creameries. It brings us back to the point brought out by Mr. Henderson, that much depends on the fertility

of the eggs. To get fertile eggs in early spring from hens which had laid well in winter requires skill, feeding and management. It will be interesting to get data from experiment in this line.

*By Mr. McNeill:*

Q. Mr. Darwin points out in his *Origin of Species* that the confining of the animal has a great deal to do with want of fertility?

A. Yes, undoubtedly it has.

*By Mr. Wilson:*

Q. The first eggs are more fertile than when the hens have been laying for some time?

A. Not exactly that. I said that when the hens are stimulated to lay during the period of high prices, their eggs are not as likely to be fertile as the eggs of hens which begin to lay in January, and which have not laid before.

*By Mr. Moore:*

Q. Mr. Gilbert's experiment in the economical raising of chickens is more successful than the farmer in our country who bought a blooded sow. The first time she pigged she had two pigs, the second time one, and the third time she pigged she had no pigs at all.

A. That gentleman evidently had not gone the whole hog as I had. The subject of winter laying and early fertile eggs is an important one, and is receiving much attention. It is altogether a matter of skill in selection, feeding and management. It is only a matter of time when the farmers will have to take up the consideration of the matter, as well as that of artificial hatching and rearing of chickens for early layers and early market.

Having read over the foregoing transcript of my evidence, I find it correct.

A. G. GILBERT,

*Manager Poultry Branch, Central Experimental Farm.*

## SOIL CULTURE.---FATTENING STEERS AND HOGS

COMMITTEE ROOM 46,  
HOUSE OF COMMONS, 28th June, 1899.

The Select Standing Committee on Agriculture and Colonization met this day at 10.45 a.m., Mr. Bain, chairman, presiding.

THE CHAIRMAN,—We have present with us to-day, by request, Mr. J. H. Gridale, the recently appointed Agriculturist at the Central Farm, who received his agricultural training at the Ontario Agricultural College at Guelph, where he took first honours in each department and was gold medalist of his year; subsequently he won the degree of Bachelor of Agriculture at Ames College, Iowa, and was the successful candidate in the intercollegiate stock judging contest held at Omaha, Nebraska, in 1898, over sixteen other contestants from a number of colleges, and is also a French scholar.

MR. CHAIRMAN, and MEMBERS of the COMMITTEE on AGRICULTURE: GENTLEMEN,—It affords me much pleasure to have the honour of appearing before you in the capacity of agriculturist at the Central Experimental Farm. I regret that I shall not, I fear, be able to submit much evidence of work performed or to give you much information gathered from my work at the Central Experimental Farm. This is due, I think I may claim, to no lack of work incepted, but rather to the short time which has elapsed since my appointment to the position I now occupy, as I did not enter upon my present duties till February 1st, 1899. Should I appear to be somewhat ambiguous in anything I may lay before you, or should any member of the committee wish a fuller discussion of any point. I shall consider it a pleasure to be questioned. I have thought that it might be advisable in the first place, as my duties are somewhat different from those of the previous agriculturist, to give you a brief outline of the work under my charge.

Part of the Central Experimental Farm has been taken up with buildings, orchards, lawns, etc. The remainder, some 200 acres, omitting some rough land which is not arable, has been set apart as a farm proper and this is under my supervision. The cattle, sheep, swine and the dairy also come in my department, and the experimental work in feeding and breeding live stock. At present we have but a very limited number of pure bred cattle, so with your permission I shall not discuss them. Sheep have not, up to the present, been kept upon the farm, but we purpose introducing them and in fact have begun to purchase some pure bred animals. As nothing of an experimental nature has been done in this line save to build a dog-proof fence, it may as well, I presume, lie over for discussion at some future date. We have some fairly good pure bred swine and some experimental work in breeding is being conducted, but it is too early to report upon this either, so I shall have to ask you to permit it also to wait for a later date.

Having given you some idea of the work under my supervision I should like now for a few minutes to describe somewhat at length the method of cultivation and the system of rotation we have introduced at the Central Experimental Farm. As I stated earlier, the farm proper consists of some 200 acres and about 30 acres of rough land. The arable land has been divided into five lots of 40 acres each, which we describe as lots 1, 2, 3, 4 and 5. It has been divided in this way for the sake of convenience and the lots, though not coming together, are as nearly as possible in one piece. They are broken up somewhat owing to other experimental work which has been introduced and the blocks, owing to the roads, are not all of a size, so we cannot have each lot in one block as we should prefer.



Lot 1 is sown with (a) pure pease (b) oats and pease mixed together which will be used as green feed, the grain and straw of course as feed also but more especially for bedding; (c) part in oats seeded with clover. We have also tried the sowing of clover with the pease and oats. It seems to be succeeding very well at present and promises to be of considerable benefit to the land. It is not usual to sow clover with pease, as I am aware, but it seems to be doing well and the land is in need of all the fertility it can get.

Lot 2 is in corn and roots—the manure is applied on lot 2—so, as you can see, in the second year lot 1 has the same crops as lot 2 bears this year. Next year it will have the same treatment as lot 2 receives this year; and lot 2 next year will have the same treatment as lot 3 undergoes this year; thus you see the order of succession of the crops which are mentioned—and, therefore, I need not state in each case what will be on each lot in succeeding years. Lot 3 this year is in grain and is seeded down with a mixture of Timothy and clovers; on low land we use Alsike and on higher land Red clover (the Common Red and Mammoth Red clovers). Lot four is this year in hay and next year it will be in pasture and hay also, part hay and part pasture.

#### ROTATION OF CROPS.

We propose using lot four as pasture that is have the pasture year immediately after the grain, we shall require only part of it for this purpose however. Lot five next year will be hay that is after pasture we will have hay. This is somewhat tentative and we are not going to introduce the whole of the land into this particular work because we are as yet uncertain as to the effects upon the meadow of the pasture but that is what is proposed at present. I might discuss here some of the advantages of a rotation of crops upon a farm. Many of our farmers are troubled with keeping up the very large amount of fencing around different areas of land which is very expensive when a farm is divided off into small fields. It entails the expenditure of a large amount of labour and material in erecting the fence and is a great waste of land for the fencing line. This dividing of our farm into five equal fields as you will see does away with a great deal of the fencing and utilizes considerable land that would otherwise be waste.

*By Mr. Featherston :*

Q. Speaking just now about a fence what did you mean by a “dog-proof fence,”

A. Well the fence that we have put up is a fence 58 inches high and has 19 strands. Along the bottom the strands are only two inches apart. All are held in place by upright wires and along the bottom, in most places covered, and in all cases touching the ground we have run a strand of barbed wire and where there are depressions in the soil we have run two or three strands of barbed wire.

Q. That is a dog-proof fence, is it?

A. Yes. This has proven to give, so far, perfect security against dogs. We are troubled a great deal with dogs out at the Central Experimental Farm, these come from the neighbouring villages and from Ottawa. Some one introduced a dog into the field the first day and we chased him a long time before we could get him out, and when we did get him out he climbed up the brace and over the fence at the corner. This could not be done from the outside. Since then there has never been a dog in the field so it may be safely said to be dog proof.

Another advantage of the introduction of a rotation upon the farm is that the crops which are suited to succeed or precede each other are placed in this order, that is before the grain we have the fertilizing value of the clover and the effect of it may be reaped in the grain crops. In the corn and roots year there is still some of the fertilizing effect of the clover left and this year we add the manure. After the corn and roots which are, as you know, ploughed the same fall comes grain again, and then the meadows are started. The next year we have the strong growth of clover (perhaps pastured to some extent) and after that the pasture. With a growth of clover this pasture will, as you see, serve to fertilize the soil for the next crop of Timothy or whatever other hay you may introduce. We are sowing this year to a small extent orchard grass, which, as you know, is suitable for certain kinds of soil only.

Another reason for the introduction of the rotation is that it ensures regularity in the application of fertilizers. Many farmers are tempted to neglect a certain field for two or three years perhaps, because it gives a good crop, and they think it can do without fertilizer, thus there is a danger of it running down. This is a mistake and the introduction of rotation will prevent the neglect. The rotation will aid in restoring the fertility of land on farms which have run down. There is probably no crop of greater benefit to the farmer than clover and this rotation gives ample opportunities for its use. As you will notice there is a succession for three years and then in the first year of the system there will be more or less clover also. On the first year of the rotation clover is put in with the oats and where there is no clover another legume such as pease which has the same action on the soil in enriching it may be used. Thus you see we have four years of legumes and one of fallow (corn and roots).

Another point which might be cited as in favour of rotation is economy of time in having all the crops of one kind together. If your land is divided into small fields and you put in a large amount of root crops, we will say, more or less time is taken up in changing from one field to the other, and if you have it altogether there will always be a saving of labour and time in this way.

The method of cultivation which we propose introducing, and which we have introduced to a certain extent, is the shallow. We do not plough over five inches deep, four to five inches, according to the soil, but not over five inches. Our ploughing will be done in the fall, quite early, say between harvest and cutting the corn for ensilage, at least the greater part of it will be done at this time; as much of it as possible. We do not propose to have the ploughing interfere with other work to any extent. The reason for this is (1) that it is a convenient time, as there is usually a spare period at that date, when no other work can be done by the horses. (2.) Ploughing shallow will keep the humus near the surface of the soil. It will ensure nitrification going on at a period when there is no crop upon the soil, and no crop will grow, viz., in the fall. If we allow the nitrification to occur in the spring, we will find that the nitrates are available too late to be of any use to certain crops. They might be available for corn, because it is a late feeder, feeding all summer, but grain gets most of its food in June and latter part of May. Now if late ploughing is followed this decomposition occurs only in the spring and the nitrates are available only in July, and then the best parts of the food of the plant are left for a time when they are not required, and in consequence they are lost and washed away by the rains.

*By Mr. Featherston :*

Q. You are recommending light ploughing for grain and all crops ?

A. Yes, shallow ploughing.

Q. For any kind of crops ?

A. Yes, for any kind.

Q. Are you going to plough deep for alternate years ?

A. No, I will explain it in a moment.

*By Mr. Rogers :*

Q. Do you just have one single ploughing in the fall ?

A. After ploughing we purpose harrowing to keep the weeds down and make the soil as mellow as possible. In this way nitrification will progress very rapidly. Just before the fall rains set in, or as nearly as possible at that point, we shall take and ridge up the soil, previously ploughed and harrowed, into ridges eight inches high, and these ridges will expose the sub-stratum which has not been moved by the plow, and these, as it were heaps or rows of soil, will be rich in humus, rich in nitrates, and rich in the other fertilizing qualities or particular properties of the soil, and they will be not so subject to washing from the rain as would be the case if the soil were left flat or if nitrification occurred in the spring rather than the autumn.

To-day we use the shallow ploughing instead of continuing deep ploughing. By it the subsoil is exposed through the winter to the action of the frost and is materially loosened up. If you plow deep and leave the soil level the surface soil is the only part that is affected by the frost. I admit that when the soil is perfectly level the frost does go down a considerable distance deeper than we plough, but it is only the surface that is materially affected, and if you can expose the subsoil to the action of the frost in some way the trouble of ploughing deep is obviated and the humus which is the all essential property of the soil is kept in the surface soil. The idea of keeping it at the surface is to render it early available for young plants in the spring. All our grains, in fact all our crops, feed near the surface especially when they are very young. There is only so much humus in the soil and that is mixed in for a distance of say eight inches. You will see that to obtain the food from that amount of humus the roots must cover a very much larger area, but if the humus is near the surface, then the root will have only a short distance to reach and the plant will have an opportunity of devoting its energy to the building up of stem and seed which are the parts needed. In root crops this is also applicable because the small roots are the ones that need most care and these are near the surface during the season of early growth.

*By Mr. Clancy :*

Q. Have you tried this shallow ploughing and having ridges after ploughing as against deep ploughing and made tests as to which is the more productive method?

A. I cannot say I have myself but I have seen the work carried on elsewhere. As you know I have not had time here.

Q. What have been your observations in the case that you saw?

A. That the method that I have outlined is superior to the deep ploughing. That is the conclusion.

Q. The reason that I ask is on account of the expenditure. The land could not be ridged without very considerable expense to the farmer?

A. We have ploughed in the fall. It is more expensive I admit but you see it is not so expensive as ploughing again.

*By Mr. McMillan :*

Q. I do not think it will be more expensive than ploughing again. I think if you plough and then harrow you will ridge the land and it will be ready if you plough in the fall?

A. It is a very quick operation.

Q. Have you seen this tried on all classes of land, heavy land as well as light land?

A. Yes, I have.

Q. And is there not a danger on the heavy clay soil of hard-pan forming at the bottom of your ploughing if you never plough deep?

A. There may be possibly but I haven't seen it in operation over five or six years, and in cases where it has been in operation that long there seemed to be no difficulty at all. The action of the frost as I mentioned earlier, seemed to loosen up the subsoil quite sufficiently to do away with any danger of hard-pan forming where there is not naturally a hard-pan. Of course in some lands you have a hard-pan of marl rock and a sort of gravelly clay that exists anyway and you cannot get over it. But where there is no natural hard-pan I do not think there is any danger. This danger if it exists might be overcome by stirring the subsoil with a strong cultivator or grubber which would loosen the lower stratum without bringing it to the top.

*By Mr. Burnett :*

Q. How do you treat the ridges in the spring?

A. We run the cultivator crosswise or a disc harrow would do. The cultivator would probably even it up more.



I have done something in swine experiments since I came here but only a very limited amount.

*By Mr. Bain :*

Q. Perhaps before the cultivation branch is left if there is any question that any gentleman would like to ask bearing on it then we would have all that evidence together. If not then we will go on with the experiments.

*By Mr. Burnett :*

Q. Have you ever had any experience in seeding down with pease before ?

A. No, I have not, not with pure pease, I have used a mixture of pease and oats, which seems to be doing well so far.

Q. I saw a young gentleman who seeded down with pease and he said he had the best catch he ever had ?

A. That is somewhat unusual.

Q. But that is a very rare thing ?

A. I should judge it would be.

*By Mr. Erb :*

Q. In that mixture what proportion of pease and oats do you use ?

A. One and one half of pease to one and a quarter of oats.

*By Mr. McMillan :*

Q. The oats keep the pease up ?

A. Yes, the oats support the pease very materially.

*By Mr. Erb :*

Q. Do you cut them with the mower or the binder ?

A. We expect to cut with the binder.

*By Mr. Burnett :*

Q. And do you intend to thresh it then ?

A. Oh, yes. We thought it was possible that if the pastures proved insufficient or poor that we could use the same mixture as supplementary feed. But there is no necessity for that this year.

Q. You said you pastured the first year. Why do that instead of mowing the first year and pasturing the second year ?

A. Clover as you are aware, to a large extent, dies out after the first year hay, in the second winter of its life, especially if you cut a second crop. Then the next year you are pasturing your cattle upon Timothy and other grass with a very limited supply of clover, and, as you are aware, clover is preferable as pasture to Timothy for fattening cattle as well as for dairy purposes.

*By Mr. Featherston :*

Q. Where do you get you clover hay, then ?

A. When clover is pastured the first year there is only a small part that will produce seed. The cattle will keep it down, and clover like all other plants is filled with a great desire to perpetuate its kind, and there will be a very much greater probability of its living through the second winter if it does not seed the first year than there otherwise would be. Clover is a biennial plant, and if kept from flowering will frequently live during another year in the effort to perpetuate its kind or produce seed, and I am counting on this to help us in the clover. However, it will not require the 40 acres for pasturing the cattle that we have at present or that we shall

be able to keep, unless our stable accommodation is greatly enlarged, so that there will be part of lot four in clover.

*By Mr. Featherston :*

Q. Then taking seed off clover seems to impair its vitality ?

A. Somewhat. Clover is a biennial and it will not flower the first year, except the crimson, which, after it flowers, is ready to die. The clover that comes up in the third year is frequently a new plant, but where the plants are well protected from frost, a good many may be expected to live to the third year, especially where they have not managed to produce seed. If it has not much vitality flowering and producing seed ends its whole career.

*By Mr. McMillan :*

Q. If you put clover on heavy clay land and there comes one season when you have no clover you will have more clover if you go and leave the land till the spring rather than cut the grass in the fall ; you will have more clover in the spring ?

A. You mean that the aftermath protects the clover roots ?

Q. Yes.

A. Yes, it protects it. Frost is a great enemy of clover, as you could see if you took a trip out to the Central Experimental Farm at present.

I wish to say a few words, before describing the experiments which I mentioned, about bacon hogs.

*By Mr. Featherston*

Q. Before you go into bacon hogs I would like to have it made straight whether you have experimented in light ploughing or not. For my part I think land should be ploughed deep once in five years any way.

MR. DUGAS.—That depends on the soil.

MR. FEATHERSON.—Yes, but with deep ploughing you go to the bottom and get all the humus contained in the land turned over.

*By the Chairman :*

Q. Don't you find that root crops settle the land ; would you not plough again ?

A. We would not plough again but just ridge it up.

Q. You would find your soil much settled without this cultivation ?

A. Oh, yes, very much more rapidly.

*By Mr. Clancy :*

Q. Has there been any case which came under your observation where there were tests made for any considerable number of years of deep ploughing in the fall, as against light ploughing and ridging up in the same year, side by side ?

A. No, not the same years.

Q. Would it not be difficult to have the same conditions under these circumstances ?

A. A farm which I have in mind for a long period of time, has been cultivated in that way, ploughed deep and manured. There was no particular rotation, however ; the deep cultivation had been followed for a number of years and it was, to say the least, not improved. I cannot say from observation that it was not improving, because I did not see it, but from reports and from what men have told me, it was going back.

*By Mr. Burnett :*

Q. This was with deep ploughing ?

A. Yes ; under deep ploughing.

*By Mr. Clancy :*

Q. Was a rotation of crops not followed ?

A. No.

Q. Would you attribute this especially to deep ploughing ?

A. Apparently.

*By Mr. McMillan :*

Q. Was it heavy land ?

A. Part heavy clay, part clay loam, and part gravelly.

*By Mr. Clancy :*

Q. Well, would it not be difficult to say which was to blame or both for the land going back in its productive qualities ?

A. Well, it would really be difficult to say under these conditions if it was entirely to blame, but from other experiments I am led to think that the system of shallow cultivation was the more important factor.

*By the Chairman :*

Q. I suppose you could say from experiments that were subsequently tried ?

A. Yes; in some measure.

*By Mr. Clancy :*

Q. On this land rotation was left out ?

A. Yes. And on part of this farm, some fifty acres, a somewhat modified system of rotation was followed which was good; one year of grain and two years clover. A section of 100 acres lies somewhat to the south of this farm and fifty acres of this was bought, not at all richer, not anything better than the other fifty acres, and this was treated by the rotation I have mentioned, that is one year grain and two years clover, and shallow cultivation introduced. Now, the other fifty acres has just been continued in the manner mentioned, deep ploughing, and I do not think any system of rotation was adopted. From advices the differences are most remarkable. I am sure the grain crop on the part where a systematic rotation and shallow ploughing has been introduced are double those on the other part. That is in four years, and the clover crops are wonderful. The soil is being built up rapidly, and that on the other side of the fence has been deteriorating, so they are trying to introduce a system of rotation on that area.

*By Mr. Featherston :*

Q. I have a neighbour who found that happen on clay land, but for the next seven or eight years after they both bore extra good crops; in fact the last crop of wheat, our neighbours told us, was too rich for the land and no manure went on for that. It was clay subsoil.

A. It is an unusual thing for a farmer to get too much.

MR. McMILLAN.—One reason probably was that the ploughing filled up too much clay one season. My experience is that you can get not more than half so much wheat without turning up to the surface, and that should be done in the fall. Land should be ploughed very square.

*By Mr. Dugas :*

Q. Would you plough as deep in light lands as in loamy lands

A. Plough about four inches, just about the same.



*By Mr. McMillan :*

Q. You never go as deep in heavy land as what we do when we are going to put a root crop on. When we are going to put roots on stubble that is when we plough deep.

A. You must get your sod near the surface for the sake of retaining the humus near that point and for nitrification. Without air you cannot have nitrification, by which nitrates are formed, and if early fall ploughing is followed they are available in the early spring.

*By Mr. Erb :*

Q. Would you recommend the same for light as heavy land ?

A. I would ridge it deeper and expose somewhat more soil to the action of the frost, but I should not recommend ploughing much deeper in the case of heavy land.

*By Mr. Burnett :*

Q. Are you aware whether shallow ploughing is practised at the Ontario Experimental Farm ?

A. I am, it is entirely ; and it is also being introduced in the Eastern States. It is finding somewhat more difficulty in making its way into the Eastern States, but it is. Shallow cultivation and clover are slowly making their mark in the west, even on the prairie ; I cannot say that shallow cultivation is entirely followed there, for as you are aware the character of the soil is peculiar, it is almost entirely humus.

Q. How long have they practised shallow ploughing at the Ontario Farm ?

A. Five years.

*By Mr. McMillan :*

Q. There is no heavy clay on the farm ; I have been over it and I know there is not. One gentleman whom I took over mine was forced to admit that the Guelph farm was not heavy land ?

A. There is some of it that is classed by soil physicists as very heavy clay.

MR. McMILLAN.—I got Mr. Rennie up into Huron and I showed him some heavy clay land there, and he admitted then that his was not heavy clay. Before you know what heavy clay land is you can not discuss it ; many people call good strong clay loam a heavy soil.

*By Mr. McGregor :*

Q. This light ploughing is very successful ?

A. Yes.

Q. To what depth is the land ploughed ?

A. Four or five inches.

*By Mr. McMillan :*

Q. It has been very successful. How deep do you plow ?

A. Four or five inches.

Q. How do you prepare the land before cultivation ?

A. By fall ploughing, and then drilling or ridging it up just before the fall rains as it were.

The CHAIRMAN—Plough early he says as early as your time will allow.

*By Mr. Erb :*

Q. If a farm has couch grass on it, do you think your system of rotation will be successful in eradicating it ?

A. It all depends, I cannot say it would alone. But if you could get your soil into a good state of fertility with the shallow cultivation which is, as you are aware, what is necessary to eradicate couch grass, it seems to me that you would not be long troubled with that grass.

Q. Yes, but it should be cultivated immediately after the crops are removed?

A. The best we can do with that, is to thoroughly cultivate and eradicate it when in the second or following year of the rotation. It is, I think, clear that early fall ploughing will do much toward the destruction of weeds and noxious grasses of all kinds. You cannot eradicate it in the cereal and leguminous crops.

*By Mr. McGregor :*

Q. How do you eradicate the wild mustard. They are troubled terribly with it in some places. How would you remove the difficulty?

A. I know of no way except hoeing and pulling. We have been trying some experiments with spraying but I cannot speak with certainty of the results as yet, since the work is only in the experimental stage. We have sprayed with two mixtures and they seem to have injured the grain more or less, but how it will affect the results in the grain crops I cannot say yet because the grain has not been harvested.

*By Mr. Featherston :*

Q. That is you have been spraying to kill the mustard?

A. Yes, to kill the mustard.

*By the Chairman :*

Q. What have you used?

A. Copper sulphate and sulphate of iron.  $\text{Cu SO}_4$  and  $\text{Fe SO}_4$ .

*By Mr. McMillan :*

Q. Have you found that spraying is successful?

A. It killed the mustard where it came in contact with it, but it injured the plants as well. We found that when it was sprayed strong enough to kill the mustard the plants seemed to be more or less injured, but it was only the upper leaves of the barley which appeared to be materially affected.

*By Mr. Featherston :*

Q. The stock has gone on growing since has it?

A. Yes. I may say this experiment was not made on the Experimental Farm however, but on a neighbouring farm. We have not enough mustard at the Experimental Farm to experiment on. The spraying was done when it was in bloom and I think it would have been better if it had been sprayed earlier. But as it was not on our own farm we could not control the exact date of the experiment.

*By Mr. Rogers :*

Q. Would it injure oats as much as barley?

A. I cannot say.

Q. The barley would be pretty far on at that time?

A. Yes it was. It was not in head at the time but the spraying injured the upper leaves. I think, however, it will grow on all right although it was probably retarded somewhat.

Q. What did it cost to use?

A. The copper sulphate costs about 4 cents per pound, and thus 100 lbs. of water or 10 gallons would cost about 8 cents when a two per cent solution is used which seems to be almost strong enough. About 500 gallons would be required for

an acre and thus the cost for material would be about 40 cents per acre. The iron sulphate costs one to three cents per pound and if used of a 10 per cent strength, which it was thought would be about the best and would injure the mustard most and the grain least comparatively speaking, it would require 10 lbs. to the hundred and would make the cost about seventy-five cents per acre for the spray. Of course there would be the labour besides, but the material would cost about seventy-five cents.

Q. How did it affect the mustard?

A. It killed the mustard plant leaves right down. The copper sulphate appeared to injure the buds the most. I have seen it only once since, but expect to go up in a day or two to see the present condition, so I can not speak more definitely. I believe the two per cent sulphate solution will prove the most efficient.

*By Mr. McMillan :*

Q. To be successful there would have to be a succession of sprayings for a number of years?

A. That is the great difficulty with mustard seed. You pull it this year and next year it comes up again and it seems impossible to get rid of it, except by several years' work.

*By Mr. Rogers.*

Q. But if it only costs forty to seventy-five cents a year for ten years it's cheap to get rid of it at that price?

A. Yes, it is. There is one feature about the mustard seed that it only germinates when it is very close to the surface, and when there is no sod or very young sod.

Q. That is what I mean, when I say that spraying would get rid of it.

A. Yes, that fact gives one a better chance to eradicate it.

Q. Won't the plant grow again?

A. No, not when all the leaves are killed.

Q. Does it grow from the seed or the plant?

A. It is an annual and grows from the seed.

Q. So that if you destroyed the root it would not germinate?

A. Yes, it would germinate from the seed. It grows from the seed alone.

Q. Can you not mow it down before the seed ripens, and so destroy it that way?

A. Yes, you could; but in order to mow down the mustard you would have to mow down the crop as well and you would lose your crop. It is a peculiar characteristic of the mustard seed that it will grow after being in the earth for an indefinite number of years. There seems to be no limit to its life when it gets into the earth. You can only be sure of its entire eradication after it has germinated.

*By Mr. Featherston :*

Q. There seems to be oil enough in the seed to protect it from decay when it is in the ground.

A. There is some material peculiar to the composition of mustard seed that seems to preserve it until it germinates.

*By Mr. McMillan :*

Q. The skin of the mustard seed seems to have the peculiar quality of keeping out all the moisture?

A. Yes. The seed contains a peculiar carbon compound which withstands decomposition very well.

*By Senator Perley :*

Q. I have always understood that mustard grew from the roots?

A. No. That is you mean that the root lives over the winter?



Q. Yes.

A. No it comes up every year from the seed.

Q. There should be no trouble in getting rid of it then. What is the seed like?

A. It is like a small turnip seed.

Q. I have looked at these fields that you see along the river and it seems to me that the mustard should be eradicated, if it were mowed.

A. You would have to mow it year after year, because when you turn up the soil every time you bring the seed near the surface it will germinate and you will have the plants coming up year after year. You let one crop of mustard ripen and the seeds scatter upon the earth and your field is ruined for many years to come. Every time you plough it and bring some of the seed, which has been buried, near the surface it will germinate and you will get mustard coming up year after year.

*By Mr. McMillan :*

Q. We bought a farm in which a farmer had grown mustard and timothy. We bought it in 1892 and we have never let it lie since we got it, and every time we plough it we get a certain amount of mustard seed now.

*By Mr. Clancy :*

Q. The way they get rid of mustard with us is to put in a hoe crop, cultivate well during the season and then put it into clover. No mustard appears in the clover, or rarely so. Then when the crop has come up turn it down again and so get rid of the mustard.

A. Yes, mustard does not come up in the clover to any extent as the clover smothers it out.

*By Mr. Burnett :*

Q. We find cultivation the best way to get rid of it?

A. It is an important factor indeed.

#### HOW TO PRODUCE GOOD BACON.

I would like to say a few words about the bacon hog. I might state that I have found and that every one has found who has studied the question at all, that there is a definite kind of hog that must be bred to ensure this kind of meat. The breeds we find best here and that have been found best elsewhere are Yorkshire, Tamworth and Berkshire. To the Berkshire there is the objection that some of the strains are short and most of them are inclined to grow thick over the shoulders, and this spoils the long side. There has to be a short "cut."

The feeds especially suited for the production of bacon are the common cereals, but there seems to be at present an uncertainty as to the effect of each of these different grains upon the quality of the meat, and although various experiments have been tried it is almost impossible to determine which are the best suited to the production of bacon that will command the top price. The trouble is that much of our bacon is soft. Many theories have been advanced to account for this, but none of them seem at present to explain the matter fully. Sometimes a certain feed, as for example pease, oats and barley mixed with milk, will give first class meat, and I may say that these three cereals with the addition of milk as a rule ensure hard bacon. But you will find soft specimens even amongst swine fed with this ration. The fat hog is probably the greatest difficulty in the way of the packer at present. He can find a home market for the fat, but the foreign market is closed for it. The fat hog is due to the breed of swine fed in most parts of Ontario—in fact all over Canada and in the United States. We have copied from the United States in the breeds of swine which we use, and in this way got into the trouble of the fat swine. This is not the only trouble, for sometimes we get amongst the swine, pigs that give bacon that is too hard. That is the fat is all right, but the lean, when cooked is of such a very firm character as to be practically tasteless.

*By Mr. Featherston :*

Q. That is it is hard and dry?

A. Hard and dry.

There is some complaint of that kind of bacon from this part of the country at present. In the west we find almost the whole trouble is from "softs" and "fats." There is also a great difference in season. At this season of the year some are soft and some are hard. The percentage varies greatly in season, and also apparently in different sections of the country. Western hogs as a rule give a greater percentage of "fats" and "softs." The reason is very difficult to explain. We are trying some experiments, but it is difficult to say what is the cause of the soft bacon.

*By Mr. Douglas :*

Q. Did you notice the effect of feeding wheat with relation to fat?

A. Some experiments were tried some time ago at the Central Experimental Farm with this end in view and it, like other grains, seemed to vary. In many cases first class bacon was produced so far as quality was concerned, and in others it was soft. At present there is being printed a bulletin published by the Department of Agriculture, Ottawa, which gives a full account of this, so I do not think I need give it any more fully to the Committee. The bulletin will be out in a short time and will be available for distribution. The bulletin is a resumé of all the work in pork feeding carried on at the Central Experimental Farm during the last eight years.

*By Mr. Bain :*

Q. Did you carry on these experiments?

A. I prepared the bulletin and carried on one or two of the experiments.

*By Mr. McGregor :*

Q. What is your opinion of clover?

A. Clover has an injurious effect on the character of the bacon when the swine are finished upon it.

Q. You advise feeding it early and finishing upon dry feed?

A. Yes, I think that is the best.

*By Mr. McMillan :*

Q. Have you experimented by feeding large quantities of mangels to the pigs when young?

A. Yes, I have seen them fed very extensively with excellent results. You cannot get anything better for young and breeding pigs than mangels.

Q. We found that the hogs seemed to get much healthier when given mangels than when fed only grain?

A. They need some laxative, succulent feeds to keep them in health.

*By Mr. Featherston :*

Q. You say there are two objectionable kinds, the fat and the soft?

A. That is from the packers' standpoint.

Q. Is it not easy to get rid of the fat?

A. In one way, by changing the breeds. It wouldn't do to bring to market hogs that are naturally fat until they are ripened. If you do not ripen hogs that are naturally fat, as the Poland China, the Chester White, the Duroc Jersey, they are of an immature character, in the lean, and if you ripen them, then the fat is too thick.

Q. Too much fat and not enough flesh?

A. Yes.

Q. That is the objection you have to these breeds?

A. Yes, for bacon.

*By Mr. Clancy :*

Q. Have any experiments ever been carried on with the purpose of definitely determining the character of bacon on all these grounds at the farm, or have the sum of the judgments of packers been taken?

A. I am not aware that I have made very extensive statements, except that oats, pease and barley with milk usually ensure hard bacon.

Q. I do not think I have made myself clear. You said there were some ways which would make fat, soft bacon, and others where the lean part would be dry and hard, and you followed that up by saying it was difficult to determine the reasons for this. The packers say soft pork is at times ascribable to the feeding of corn?

A. Well, I do not say that, and I will not say that packers ascribe that to corn entirely.

Q. It has been said here over and over again?

A. I have interviewed many packers in the past month, several personally and most of them by letter, and I find in very few cases do they ascribe the quality of bacon to corn alone. Many of them are rather of opinion that corn is not to blame for "soft" bacon. It seems, however, to produce a very large percentage of "fats."

Q. The packers are of this opinion?

A. Yes.

Q. Some of them have stated definitely that they have a fixed area in which they do not pay the price, as in Kent and Essex?

A. I have travelled through Kent and Essex in the first few days of this month and about 90 per cent of the pork was of the character called "fat."

*By Mr. Featherston :*

Q. Are these breeds common there?

A. Yes.

*By the Chairman :*

Q. This 90 per cent of the "fat" character were of these breeds?

A. Yes.

*By Mr. Calvert :*

Q. So that it is more the effect of breeding than feeding?

A. Yes. I had also some loads of nearly pure Tamworth shown to me, which were shipped to a packer by one of the buyers in Chatham, and out of that load of Tamworths you say there were no "fats," but there were about 75 or 80 per cent of "softs."

*By Mr. Burnett :*

Q. And fed on corn?

A. I do not know in every case. I interviewed the feeders of about twenty-five of them. I saw the pigs here and went west and saw the breeder; he told me how they were fed.

*By the Chairman :*

Q. You might give your conclusions without mentioning names?

A. He had fed them on boiled beans, with a small admixture of shorts and some milk, and they had been confined in very limited quarters, cramped.



*By Mr. Featherston :*

Q. That is what they are fed on ?

A. Yes, and every one of them was soft.

*By Mr. McMillan :*

Q. Have you tried any experiments to find whether boiled feed would make softer bacon than grain fed raw ?

A. No, I cannot say I have. I received a letter on Saturday from a packer in Ingersoll, and he said an experiment had been conducted there with corn meal put in hot water, scalded, and left for about twenty-four hours and then fed. He said these swine had been under his personal supervision, and he had killed them and had classed them as "straights" and "hards." They were then in process of curing, and I wrote to him on Monday and asked him to send me a report of his final inspection.

*By Mr. Erb :*

Q. Did he mention what breed they were ?

A. No.

*By Mr. Featherston :*

Q. Do you know if many beans are fed in the west ?

A. Through Essex and Kent I found that the people were maligned to a great extent, that there was not nearly the amount of beans fed that had been ascribed to them. I heard from a good many people that large quantities of beans were used, but I found when I went there that it was not so. A few people use them, but they were under the ban of buyers, and even these few were rapidly abandoning the use of beans.

Q. It is only where beans are a little damaged that they use them at all ?

A. Yes, that is so.

*By Mr. Clancy :*

Q. It is a slander to say that men feed the pigs on beans, and it is only when damaged that they use them at all. There are not 50 per cent of the beans grown there that there used to be ?

A. I agree with you.

*By Mr. McGregor :*

Q. Would you advise the feeding of ground feed or just raw ; it costs about five cents a bag to grind it ?

A. If you will permit me I will read this report.

*By Mr. Clancy :*

Q. Before you do I would like to ask this question, which I think is pertinent to the discussion : Have you or any of the departmental officials inquired of the packers whether they keep steadily in view the breeds of hogs as well as the places from whence they come ?

A. I had a letter from another packer on Saturday, and he said that he ascribed it entirely to corn. Now a packer from the same section said it was not corn, and a packer in this section said that he does not think it is corn alone.

*By Mr. Calvert :*

Q. But you gave us one example a while ago where a man fed corn ?

A. That was the man at Ingersoll, he fed cornmeal scalded.

*By Mr. Featherston :*

Q. And they were good ?

A. Yes.

*By the Chairman :*

Q. Were they shut up ?

A. He wrote me lately, and not full particulars.

*By Mr. Holmes :*

Q. I did not understand you to say you had tried corn at the farm.

A. Last fall Prof. Robertson had some experiments carried on here with the feeding of corn, and some years ago we had experiments with corn, but did not test the quality of the bacon ; but last year the bacon was tested, and was very good, I think.

*By Mr. Calvert :*

Q. What class of hogs ?

A. I did not see them, but from what Mr. Elliot, our herdsman, told me, they were Yorks, and Berks.

*By Mr. Featherston :*

Q. You must be careful not to feed too long ?

A. Yes ; and if you rush them there is a fear that they will put on too much fat.

*By Mr. Holmes :*

Q. Would you express an opinion as to the feeding of corn or otherwise ?

A. No.

*By Mr. Rogers :*

Q. It is evident the mixed ration is best.

A. Yes.

*By Mr. McMillan :*

Q. Don't you think there is something in the way the young pigs are treated if they get lots of room they are better ?

A. Yes, I think it is advisable, from the standpoint of economy and quality too.

*By Mr. Burnett :*

Q. You say that breed and exercise have as much to do with it as feeding ?

A. Yes ; I can give you no experiments to prove this, but from general observation I think breed and exercise have as much to do with it as feeding, or more. However, I may say we have experiments going on to collect information on feeding the different feeds to the best breeds, growing, exercise, and almost every imaginable condition.

*By the Hon. Mr. Perley :*

Q. When will it be out ?

A. It is just recently started, and the result will be out in the next report.

Q. I thought you would issue a bulletin.

A. The bulletin is now in hand. It includes only one experiment conducted by myself, which I will read to you, if you wish it.

Q. When will that be out?

A. It is in the printer's hands at present.

*By Mr. McMillan :*

Q. I understood that the experiments have only just been entered upon since you came here.

A. It includes one or two experiments which I have carried out, but as I stated previously, it is a resume of all the work along this line conducted at the farm. I think, with your permission, I will have this go into the evidence.

FATTENING SWINE.—RATIONS AND BREEDS.

*By Mr. Featherston :*

Q. Read a portion of it; give us a synopsis.

A. We had twelve swine.

Q. Is this the experiment?

A. Yes. They were divided into different lots; some of these were fed on a limited diet, and some on an unlimited diet. They were allowed all they could eat. They all had milk, so that it is not a test of the hardness resulting from that feed.

Q. Did they get all the exercise they wanted?

A. It was the winter time, and they had some exercise. We had the best results from feeding a limited ration of ground grain. We found about five per cent of the ground grain was saved by feeding it ground, as contrasted with that which was fed whole, or, to express it differently, that about five per cent more grain was made by feeding it ground than by feeding it whole.

Q. That was a saving in feed and a gain in production?

A. Yes. And in the case of a limited, as contrasted with an unlimited ration, where we have had the ground grain, and limiting the supply, they made much more rapid gains than where we fed them all they would eat. For instance, feeding ground grain dry they gained 1·18 pounds per day, and they gained 1·11 pounds per day when fed the same mixture and the same quantity unground.

Q. That was live weight?

A. Yes, it is live weight I am giving you right along. In the other case, where they were fed on whole grain, it was 1·11 where they had an unlimited ration, all they would eat; and, as I have said, the gain in the third lot was only 1·11. My report upon the experiment is as follows:—

When I assumed the duties of Agriculturist on the Central Experimental Farm 1st February last, I found thirteen pigs ready for feeding. They were from two litters:

(1.) Eight pigs Polland-China (sire) and Tamworth crosses farrowed 26th September, 1898.

(2.) Five pigs Yorkshire (sire) and Chester-white crosses farrowed 21st September, 1898.

Both lots had remained with the sows till eight weeks old, when they had been taken off and confined in rather cramped quarters. They had been fed on milk, shorts, chopped oats and boiled potatoes.

On the 15th of February, an experiment was incepted:—

Since the number of swine was limited and they were not of a suitable type for bacon, it was decided that the best thing that could be done under the circumstances was to feed the swine in such a way as to furnish some data upon the production of hard and soft flesh and upon the effect of limiting the feed.

Since to have less than four in a group in any experiment is seldom advisable, it was decided to form three groups of four each, to be fed as follows:—

Lot A, was to be fed whole grain, a mixture of equal parts oats, peas and barley, and three pounds of milk each daily.

Lot B, was to be fed ground grain, equal parts oats, peas and barley, and three pounds of milk each daily.



Lot C, was to be fed one pound whole grain mixture, equal parts oats, peas and barley, at noon, and all the ground grain (same mixture) they would eat at morning and evening meals, with three pounds of milk each daily.

Lots A and B were to be limited as to quantity, starting off at three pounds per diem to each animal, and a slight increase made each week.

TABLE I.

Lot.	1 Weight to start.	2 Weight to end.	3 Gain.	4 Amount of grain eaten.	5 Amount of milk eaten.	6 Value at start.	7 Value of feed.	8 Total cost.	9 Value at end.	10 Gain.	12 Daily rate of grain.	13 Cost 1 lb. gain.	14 No. lbs. meal for 1 lb. gain.	15 No. of days on experiment.
A	411	704	338	1220 $\frac{1}{2}$	916	12.33	13.57	25.90	31.54	5.64	1.11	4.01	3.61	76
B	404	761	355	1220 $\frac{1}{2}$	916	12.12	13.57	25.69	32.34	6.65	1.18	3.82	3.43	76
C	412	751	339	1303	916	12.36	14.40	26.76	31.92	5.16	1.11	4.24	3.84	76

Observe: 1. Difference between A and B, 5.3 per cent saved by grinding. 2. Difference between cost of A and C, and A and B.

TABLE II.

Lot.	Pig No.	Weight to Finish.	Breed.	Appearance at Finish.	Packers' Remarks.	Classed for firmness.
A	45	206	PC X T	Very fat; short.....	Very fat, but firm.....	1
A	46	162	CW X Y	Apparently immature; short	About right fatness, but rather soft.....	1
A	47	214	PC X T	Very fat; short.....	Very fat; very firm.....	1
A	48	160	PC X T	Good bacon; short.....	Good bacon; very firm.....	1
B	49	208	PC X T	Fat; short.....	Too fat; but firm.....	1
B	50	190	CW X Y	Too fat; short.....	Rather heavy shoulder; firm.	1
B	51	197	PC X T	" ".....	Fair bacon; firm.....	1
B	52	166	CW X Y	Fair bacon; short.....	" ".....	1
C	53	187	PC X T	" ".....	" ".....	1
C	54	228	PC X T	Grossly fat; short.....	Too fat; firm.....	1
C	55	175	CW X Y	Fat; short.....	Rather fat; not very firm....	1
C	56	161	PC X T	" ".....	Fair bacon; not very firm....	1

## CONCLUSIONS.

1. This experiment would emphasize the fact noted in Prof. J. W. Robertson's experiment conducted here recently, that feeding peas, oats and barley practically insure firmness in pork. Especially if milk be added to the ration.

2. It would seem to indicate, further, as many experiments have already shown, that ground grain is apparently more economical than whole grain.

3. It would seem to show, also, that limiting the quantity fed gives better returns in both quality and quantity of pork from a given amount of feed.

4. It would also seem to show, further, that breeding to a type is necessary if we are to produce good bacon hogs.

By Mr. Clancy:

Q. What were the ages of these pigs?

A. They came on the 26th of September and we sold them on the first of May.

Q. Would you consider this fairly good results?

A. As to the feed?

Q. As to the gain made each day.

A. Yes, for the age of the pigs. Because we are just including the gain for the period of fattening.

Q. The reason I ask is that a gentleman kindly handed me a statement of experiments he had made where in some cases the gain had reached two pounds per day.

A. Over what length of time?

Q. I think less than two months, the hogs ranged from 65 to 90 and 100 pounds.

A. Oh, during that period they gained that much.

Q. You are taking them from birth?

A. No, from the time they weighed about 90 to 100 pounds.

Q. Well that is about the same date as the others?

A. No, it is not the same.

Q. I said they weighed from 65 to 100 pounds at the time they were put into the experiment.

A. A hog from 75 to 100 pounds weight will put up a greater amount of weight for the same amount of feed than the hogs of greater weight.

Q. What weight had they when you started?

A. About 100 pounds.

*By Mr. McGregor:*

Q. Have you ever tried soaking the feed?

A. Yes.

Q. What is the result?

A. It is almost equal to grinding and much cheaper.

Q. Almost equal if it is given time to soak?

A. Yes.

Q. Corn is pretty hard to soak?

A. It takes a long time. I notice that in some experiments which they carried on at the farm before I was connected with it they soaked the corn for 54 hours.

*By Mr. Featherston:*

Q. I found the best results from boiling the corn this winter for young pigs.

*By Mr. McGregor:*

Q. If you charge for the wood and time for boiling, etc., it will not pay?

A. The conclusions we reached from these experiments seem to indicate, as many experiments had already shown, that ground grain is apparently more economical than whole grain, also with respect to limiting the food it would seem to show that the limiting of the quantity of food gave better returns in both quality and quantity of pork from a given amount of food; it would also seem to show further that breeding to a type is necessary if we would produce good bacon hogs.

Our grinding cost us about three per cent or about one cent per bushel, and we calculate that we save two or three cents a bushel, so that we made a saving of one and a half cents by grinding.

*By Mr. Hurley:*

Q. What kind of grain did you grind?

A. Pease, oats and barley. We have an engine with which we do our grinding, and I calculated the cost of it some time ago, and allowed for the use of the engine and coal and two men, it takes two men to run our engine and grinder; we can, of course, and we usually do use the engine for cutting hay at the same time, but I did not take that into account.

*By Mr. McMillan :*

We grind all our own food with a windmill, as we consider it a saving to grind our own feed rather than draw it to the mill.

*By Mr. Hurley :*

Q. There are a great deal better results from cracking some kinds of grain than others, and we found that with pease we did not get any benefit from grinding ?

A. No, there is no need to grind them, the hogs digest the whole pea very well.

Q. Barley is different, you get no real use from barley unless it is ground ?

A. No, it must be ground to be of the greatest value.

Q. It must be ground fine or it is no earthly use ?

A. The next heading I have is "Remarks upon steer experiments."

*By Mr. Clancy :*

Q. What breeds of hogs have you at the experimental farm, and how many of each ?

A. Some of our breeding stock is to be sold, and I would not like to say definitely the number we have there just now, because you might come up and find it different, and I am not quite certain as to how many of each breed we shall retain. We have Tamworth, Yorkshire, and Poland-China boars at the present time, and we are in correspondence to secure a Berkshire. We had a Berkshire, but we sold him after keeping him three years. We have two Berkshire sows at present, and we may part with one. We are selecting this stock, keeping the best and letting the poor ones go, and those which are old.

Q. Is that all you have on the experimental farm ?

A. That is all the Berkshires we have, just two sows. We usually have more, but that is all we have at present.

Q. And of the other breeds ?

A. Two or three Tamworth sows and a boar, four Yorkshire sows and a boar, and no old Chester Whites at present.

*By Mr. Featherston :*

Q. Have you any Poland Chinas ?

A. Two Poland China sows and a boar.

*By Mr. Calvert :*

Q. You have some small Chester Whites ?

A. Yes. Five small Chester Whites, five small Poland Chinas, three small Yorkshires, three small pure bred Tamworths. That is all the pure bred stock we have.

Q. Where did you get all the little pigs in the pen ?

A. We bought part of them around here. They are a mixed lot; we bought about eighty of them in Kent and Essex.

*By Mr. Clancy :*

Q. For the purpose of experimenting ?

A. For the purpose of experimenting.

*By Mr. Featherston :*

Q. When did you get them ?

A. A week ago Saturday.

Q. Have they developed any sign of disease ?

A. They are not from the quarantined section.



*By Mr. Clancy:*

Q. Do you know the breeds?

A. The breed of each pig is sufficiently marked to indicate the class. That is indicated sufficiently I think. In some cases there are some white ones; but they are all pure bred or half Tamworth. The whites have Yorkshire in them. The black and red have Beek or Poland China.

*By Mr. Calvert:*

Q. Is this the first experiment you have tried with them outside there. The pens looked new?

A. Yes, it was just finished on Saturday. There was no pasture there before either.

*By Mr. Clancy:*

Q. You say there are no Berks nor any that are thick?

A. No it is not a comparison of breed or fats and straights, it is a test for soft bacon.

Q. Don't you think it is an important thing for the Experimental Farm to settle this question.

A. The breed question as to fats is pretty well settled.

#### FATTENING STEERS.—RATIONS AND RESULTS.

To turn to steers I might say that in feeding it is most important to start right, that is select the steers. Unless the steer is of a particular type and breeding as a rule it is a waste of money and feed to feed him. Not that you will not get as great gains daily but you will never have a steer which will be of the same quality and which will command the price that the well bred steer will command. In starting feeding the method we are following here is to provide a succulent ration. We give them ensilage, and if we have roots we give them roots also. Not only succulence is required, but bulk, and hay and straw are mixed with it, and occasionally long hay, one lot we have been feeding long hay, considerably, because it is of inferior quality.

I might mention a point which came up in a lot of steers we sold about a month ago. I marked four of these steers in order to find out the result when they were killed. No. 1 was a dairy type of steer; he gained very rapidly and kept up his end with the rest of the lot in that way, but he never looked anything. You would never imagine he was gaining half the amount the scales showed.

*By Mr. Featherston:*

Q. What was he, Aryshire?

A. He seemed to have some Aryshire, and a very little Short-horn. He had very little beef breeding. He dressed 56.14 per cent.

Q. What weight was he taken at living?

A. Fasted weight. In that carcass of beef, although he was a small steer, weighing only 1,140 lbs. live weight fasted, there was more fat than on any other steer in the whole lot. That is more inside fat, more waste fat, and the butcher here, a man of considerable experience, characterized him as a steer that would bring a very low price for beef.

*By Mr. McMillan:*

Q. How old was he?

A. Three years.

Q. If you had a steer that would fatten at two years it would be better beef? In giving experiments at the farm I think it would be better to give the age of each animal. I happened to be reading up before I came down Mr. Stewart's experiments in feeding in the United States, and he says you can make beef up to one year

old at three dollars per hundred, but after two years it costs over seven dollars a hundred, and Groff's experiments in this show that the young animal is always the animal that gains most rapidly, so it is of importance in buying a lot of animals for the farmer to know the age of the animals.

A. Yes.

No. 4 was a large lank steer. He had been off his feed for a little while, and although a few days before he was sent to the market he had picked up very well and filled up, he weighed 1,450 lbs., and weighed dressed 816 lbs., 56·27 per cent, a little better percentage than the dairy bred in spite of the fact of his having been off his feed and in rather bad condition. But he was rather a lean steer and the butcher characterized him as a second class steer. That is compared with No. 29. No. 29 weighed 1,335 lbs. live weight; dressed he weighed 860 lbs. That is 59·1 per cent of dressed carcass.

*By Mr. McGregor :*

Q. Did you give the age and weight when they went in?

A. I will give you that in a few minutes. This is just to illustrate the importance of selecting the right kind of animals. This steer was what the butcher characterized as a perfect carcass, the right size, compact and well developed in the loin and the ham, the points of great importance.

*By Mr. Calvert :*

Q. What breed was it?

A. Three-quarter Short Horn, pretty well bred. So was No. 4, if it comes to that. No. 32 was a little Hereford, not quite two years old, and well bred; he was fed the same as No. 29, and rushed right forward. He looked like a barrel on four posts, he was so round and big. He weighed 1,035 pounds and he dressed 618 pounds, which is 59·71 of the live weight, the highest per cent that any of the steers dressed. But the beef was too fat; the whole outside was covered with a layer of fat, yet although the fat was in good shape there was not nearly as much as in No. 1.

*By Mr. Featherston :*

Q. That is the leaf inside?

A. Yes; but the whole carcass was a mass of fat.

Q. What did you say the butcher said about the carcass?

A. He was sure there would be a little more waste than No. 29.

*By Mr. Calvert :*

Q. What was the quality of the meat?

A. I do not know from tasting, but the butcher said that No. 29 would be better than this one would be—he used some technical word that I cannot remember—that it would not taste well.

*By Mr. Featherston :*

Q. That it was too young?

A. That it was too young for the amount of fat on it. An important point is the care of the animals; unless treated with kindness and given attention they will not gain nearly as rapid.

*By Mr. Erb :*

Q. Were these animals dehorned?

A. No. We have not tried dehorning.

*By Mr. Featherston :*

Q. Were they tied up in a stable ?

A. Yes.

Q. How long were they fed ?

A. These steers were fed from the 10th of November.

Q. They were bought before you went there ?

A. Yes.

Q. Where did you get them ?

A. We got them right around here. They had been purchased by Mr. Elliott just through this section of the country ; I think he went over a radius of twenty or thirty miles. They were fed for some time on pasture and then introduced to the preliminary fattening on the 10th of November, when they were put on ration No. 1, consisting of fifty pounds of ensilage, twenty-five pounds roots, five pounds straw, and five pounds of hay. They receive forty-six pounds of that mixture daily. They were fed on that for the rest of November and through December. Then in January they were fed on the same mixture, and some meal—not all on the same meal, I will discuss that presently. In February they were fed on the same mixture and four pounds of meal, and the fifth month they had six pounds of meal, which was sometimes down to five and five and a half pounds. The last eight weeks we fed them somewhat differently.

Lot No. 1 was fed on ration No. 1, that is fifty pounds ensilage, twenty-five pounds turnips, five pounds of straw and five pounds of hay, and fed with a mixture of oats, pease and barley. The cost of these steers was \$129.88 and it cost to feed them \$67.79, making a gross cost of \$197.67. The proceeds when we sold them were \$217.35, leaving a profit of \$19.68, or a profit per steer of \$4.92. The last weight of these animals was 4,973 pounds, and as their first weight was 3,945 pounds this lot gained 1,028 pounds during the time they were fed, which was an average of  $255\frac{3}{4}$  pounds, or an average of one and one-third pounds per day from the time they started feeding.

Lot No. 2 were fed on the same rations with oats, pease and barley half, and half cotton seed meal, except in the last month when they got only two pounds of cotton seed meal, and at the end of the fourth month they were taken off that and given oats, pease, and barley for the other two months. Now these steers could have been sold to better advantage if sold earlier, but for certain reasons we were unable to sell them, and, therefore, our profits were not so great, we averaged \$4; and we paid for meal one cent a pound, ensilage, \$2 a ton, hay, \$5 a ton, and roots \$2 a ton.

Q. What was the gain per day ?

A. This lot gained 1.31 pounds. The cost of this lot of steers was \$129.88, the cost of feeding them was \$69.27, and the gross cost was \$199.15. The proceeds amounted to \$217.78, leaving us with a profit of \$18.61, or an average of \$4.65 per head. The first weight of these animals was 3,970 pounds, and their last weight was 4,983 pounds, showing a gain of 1,013, or an average of  $262\frac{3}{4}$  pounds, being a daily average, as I have said, of 1.31 pounds.

Lot No. 3 were fed on ration No. 1 with pease, oats and barley and half oil meal, except in the last month when they got two pounds of oil meal and four pounds of the mixture. The steers cost \$131.04 and the cost of feed was \$59.66, a total cost of \$200.70. The proceeds amounted to \$214.59, leaving us with a profit of \$13.89, or an average of \$3.47. The last weight of these animals was 4,910 pounds as against an initial weight of 3,980 pounds, showing a gain of 930 pounds, or an average of  $232\frac{1}{2}$  pounds. They gained at the rate of 1.21 pounds per day, which is the lowest of the whole thirty-two.

*By Mr. Erb :*

Q. Was the oil meal linseed or oil cake ?

A. Cake ground up.

Lot No. 4 was fed on ration No. 1 with meal, half oats, pease and barley, and half corn meal. This lot gained  $256\frac{1}{4}$  pounds on the average or at the rate of 1.33



pounds, exactly  $1\frac{1}{3}$  pounds per day. The cost of this lot of steers was \$131.53 and the cost of their feed \$67.98, making a gross cost of \$199.51. They sold for \$219.37, giving us a profit of \$19.86, an average of \$4.96 $\frac{1}{2}$ . These animals weighed at the start 3,995 pounds, and when sold, 5,020 pounds, a gain of 1,025 pounds.

Lot No. 5, was fed on ration No. 1 with meal, half bran and half corn ground. This lot gained at the rate of 1.29 pounds per day and the average gain was 249 pounds. The cost of these steers was \$131.53, and their feed cost \$67.20, being a gross cost of \$198.73. The proceeds were \$218.13, giving a profit of \$19.40, an average of \$4.85.

Lot No. 6 were fed on ration No. 1, and in addition to this they were fed one quarter bran, one quarter corn meal, one quarter oil meal and one quarter cotton seed meal. These animals cost \$130.54, and their feed cost \$67.46, or a total of just \$198. We got for them \$215.69, making a profit of \$17.69, or \$4.42 $\frac{1}{4}$  each. The last weight was 4,935 pounds, as against 3,965 in the first place, or a gain of 970 pounds, so that these animals gained on an average 245 $\frac{1}{2}$  pounds, or the rate of 1.27 pounds per day.

Lot No 7 was fed on half oats, pease and barley, and half corn ground. These steers cost us \$130.05, and their feed cost us \$64.45, or a gross cost of \$194.50. They brought \$217.85, being a profit of \$23.35, or an average of \$5.84. They gained 1,036 pounds, from 3,950 pounds to 4,986 pounds, an average gain of 259 pounds. They gained at the rate of 1.35 pounds per day. This is the lot that made the greatest gain per day and the greatest profit.

*By Mr. Featherston :*

Q. They all had the same roughage ration ?

A. No, lot No. 7 was on a different ration ; it consisted of ensilage 50 pounds, hay 5 pounds, straw, 5 pounds ; they had no roots.

*By Mr. McMillan :*

Q. How much of this mixture did they get ?

A. Forty-six pounds mixed in that proportion.

*By Mr. Burnett :*

Q. What breed were they, Durham ?

A. These were Durham grades.

*By Mr. Featherston :*

Q. What was the cause of the greater increase in this case ?

A. It may be due to the absence of roots, but there is the statement.

*By Mr. McMillan :*

Q. Have you tried any lots in boxes, loose ?

A. Not yet ; I saw Rennie's statement on that subject.

Lot 8 had a somewhat different ration again. They were fed on a ration of 50 pounds of ensilage, 5 pounds of straw, 5 pounds of long hay and 25 pounds of turnips, with one-half pease, oats and barley, and one-half corn ground, but they were fed only four pounds each during the experiment. These steers cost \$131.53, and the cost of their feed was \$69.25, making a gross cost of \$200.78. They brought in \$216, a profit of \$15.22, at \$3.80 $\frac{1}{2}$  each. Their weight was 3,995 pounds, and when sold they weighed 4,945 pounds, a gain during the time the experiment had lasted of 950 pounds. They gained 237 $\frac{1}{2}$  pounds each, or at the rate of 1.23 pounds per day. During the last two months they were all fed on the same ration, No. 1, and from five to six pounds of meal per day. The last two months were the most expensive of the whole period, and we were compelled to take lower prices than if we had sold them a month earlier, and this reduced the profit greatly.

*By Mr. Featherston :*

Q. What did you sell these cattle at?

A. We sold them at \$4.60.

Q. How did you sell them?

A. Well, the system or the way in which we sold these was, they got no breakfast and were weighed immediately after breakfast time, and we allowed five per cent off.

Q. They were fed after but not before?

A. Yes.

Q. You say you fed them so that the weights you figured on for the percentage of beef was feed weights?

A. No, it was fasted weights with five per cent off.

Q. That makes quite a difference?

A. Yes, it does make quite a difference.

Q. I should think the fasting was a proper thing?

A. We had an experiment in that yesterday. We sold twenty-nine steers yesterday, and I had them weighed on Monday night, and again yesterday (Tuesday) morning after the breakfast hour, but before being fed or watered, and I found they weighed about three per cent less by not getting their breakfast, and with his allowance of five per cent it made eight per cent that we allowed them.

Q. That is a pretty heavy saving?

A. Well, no, if you ship them to a point on the railway they will lose about ten per cent.

*By Mr. Featherston :*

Q. The usual way is to sell them after they are fed at the market, and are weighed full from their stable?

A. I would like it much better. The reason we undertook the feeding of these steers was that when I arrived here we had a great deal of roughage which was of an unsaleable character, and we wished to get rid of it. A good deal of this was ensilage, and we wished to empty the silos for repairs, as they were badly needing it, and another part of it was clover hay, which had been badly exposed, and we wanted to get rid of it. It was a question of either getting rid of it by feeding it or of losing it; so we bought around here twenty-nine steers, and we had to pay very high for them, as the prices were away up, and we were the buyers and wanted them, and the people who had them didn't want to sell them. They cost us \$1,094 for the twenty-nine steers.

Q. What would that be per pound about?

A. I cannot tell you the average per pound, but by the list I find that lot 1 composed of ten steers which had been fed on ensilage, hay and straw, and in pretty good average condition cost us \$40 a piece, and weighed 915 pounds.

*By Mr. McGregor :*

Q. That is pretty prices?

A. Yes, but it was a case of necessity.

Q. On what date did you buy them?

A. On 21st February.

Q. That is pretty late.

A. Yes, it was.

Q. Is that the lot you have just sold up there now?

A. Yes, partly. The other lot of ten cost us \$330; they were bought on the same date. That other lot of nine cost us three and one-third per hundred; they were bought on the 29th of March, but they were a smaller lot.

Q. They had not been fed before you got them?

A. They had not been fed at all, save a mere maintenance ration.

Q. Were they in a barnyard?

A. Yes, around a straw stack, up in the Quyon district.

Q. You have them now?

A. No; we sold them yesterday. We had to sell them. I didn't want to get them, in the first place, on the conditions, but it was better than to allow the feed to lie over. The average selling price, in the first lot, was \$4.60, the second lot \$4.25, and the last lot \$3.50. It cost us about \$80 for meal, and the whole of the steers cost us \$874. They brought us \$1,094.34, which was a gain of \$220.30, and deducting from that the \$80 for meal, we have \$140.30 left for the roughage.

Q. You have not allowed anything for labour?

A. We did not count anything for labour, because the manure is worth more than the labour.

Q. Have you any estimate of what they consumed in feed?

A. No; I have not made it up yet. We only sold them yesterday.

Q. Did you not make a mistake when you gave the cost of the steers at \$1,094? Was not that the selling price?

A. If I said \$1,094 it was a mistake. They cost us \$874, and we received for them, when we sold them \$1,094.34.

Q. Do I understand you sold these at \$3.50 per 100?

A. That is the small lot; that is, the ones that cost us \$3.33. I count that that lot made us the most money, because we didn't feed them any grain worth mentioning. The first ten weighed 915½ pounds each, and cost us \$4.37, and the second ten each weighed 770 pounds, and came from around the straw stack, and we got them for \$4.28.

*By Mr. Featherston:*

Q. Were all these sold for killing?

A. All sold to the same man.

Q. And were they all fit for killing?

A. And good as you would get in the country, on the average. They were very juicy looking animals.

*By Mr. Gilmour:*

Q. What do you mean when you say as good as you get in the country, on the average? Don't we get as good in the country as we do in the city?

A. Well, what I mean is this: That a drover goes out into the country and buys old cattle from farmers which are not, on the whole, as good as the steers we sold.

#### IMPORTANCE OF KINDLY TREATMENT.

*By Mr. McMillan:*

Q. Give us that experience of yours with the steers.

A. Some time ago we had trouble with the steers, that is, they seemed to be uneasy, and they didn't seem to be doing well. I knew we had a man that looks after them than whom there is probably not a better feeder for miles around. He is a most careful and kind feeder, and I have never seen him in my time upon the farm—and I have often been in his stable when he didn't know of it—that he was not looking after the stock most carefully. As I have said, the steers seemed to be uneasy, and we couldn't account for it. Mr. McMillan mentioned it to me about the same time, and I undertook to find out what was the cause of it. I lay around the stable for some time and couldn't find anything, and at last Mr. Elliott went one night and found three or four small boys in there switching them and throwing rocks at them. It was very warm weather, in the summer, and the boys were pegging sticks and rocks at them through the open doors and windows. Of course I stopped them at once.

Q. Where did these boys come from?



A. Oh, they came from around the farm. They used to play ball as long as it was light enough, and then when it came twilight, and they couldn't see to play ball, they were amusing themselves with the steers.

Q. Did any of these boys belong to the professors up there?

A. I don't think any of the professors up there have boys.

Q. Did you switch them?

A. I did not think it was permitted to switch the boys. They were sent away, and they have never been around the steers since. During that period of two weeks they gained only a pound a day, when they had been gaining two pounds steadily. Of the 29 steers that I spoke about, one lot gained at the rate of 1.82 pounds a day; that was the fattest of the lots. The second gained 2.26 pounds per day, and the third lot 2.22 pounds per day. During the whole period lot No. 1 gained 226 pounds; lot No. 2, 281½ pounds; and lot No. 3, 195 pounds. The general result of the feeding of these steers was as follows: Lot No. 1, 10 steers, cost \$4.37, were bought on 21st February. The average weight at the start was 915½ pounds. They were fed for 124 days, and at the conclusion they weighed 1,141½ pounds average weight, making an average gain of 226 pounds each, or a daily gain of 1.82 pounds. Lot No. 2, composed of an equal number of steers, cost \$4.28, bought on the same day, weighed 770 pounds at the start, fed the same period, and at the end weighed 1,051½ pounds each, making an average gain of 281½ pounds, the average daily gain being 2.26 pounds. Lot No. 3 was composed of 9 steers, bought on the 29th March at \$3.33, weighing 480 pounds at the start and 675 pounds at the end, making an average gain of 195 pounds during the 88 days they were fed, or an average daily gain of 2.22 pounds.

Having examined the preceding transcript of my evidence, I find it correct.

J. H. GRISDALE,  
*Agriculturist, Central Experimental Farm.*

(C<sup>u</sup>)

T H E E V I D E N C E

PART II

IMMIGRATION AND COLONIZATION





(C)

## IMMIGRATION AND SETTLEMENT, IN 1898.

COMMITTEE ROOM No. 46,  
HOUSE OF COMMONS,  
OTTAWA, 19th May, 1899.

The Select Standing Committee on Agriculture and Colonization met this day, at 11 o'clock a.m., Mr. Bain, chairman, presiding.

Mr. James A. Smart, Deputy Minister of the Interior, was present at the request of the committee, and made the following statement:—

I may say, Mr. Chairman and Gentlemen, that the Department has pursued the same policy, practically, with regard to immigration during the past year that has been in vogue for the last two or three years; that the results from the efforts put forth, as most of the members of the committee probably know, have been satisfactory, at least to a degree, and possibly such as to encourage us with the hope that the coming year will show even greater success in our work. Our expenditure last year was practically the same as the year before, a little over \$250,000. This expenditure is divided; a certain part being set apart for work in Great Britain and the Continent, which is under the direct supervision of the High Commissioner for Canada at London, and a portion set apart for work in the United States, the balance being devoted to the purpose of the reception of immigrants and their location on lands in this country.

The Department has given very special attention to the necessity for the latter course, and it has been found that possibly the best part of the work that is being done for Canada to-day is in connection with caring for those who come to the country. We have, as you all know, the seaport offices of the Department with their staff of guardians, caretakers, and so on; and also the staff at Winnipeg, under the commissioner of immigration there, Mr. W. F. McCreary, who receive the immigrants on their arrival in the West. I may say that the majority of the immigrants, of course, who come to Canada now go to Manitoba and the North-west Territories to settle, although a very large number remain in eastern Canada. We have in the west offices for recording the arrivals, taking their names, and officers who are sent forward with those persons, or with the representatives of any large body which may arrive, to select lands on which they can locate. As a rule the immigrants now from the Old Country come in larger bodies than heretofore—it is very seldom that we have small parties—the bulk come in large numbers, and when they have not decided on their destination, or rather on their location, it is usual to send out an officer of the Department, who knows the country, with a delegation from these people to show them different parts of the country for the purpose of deciding as to the location of the settlement, and generally the people who come together in that way go to one district.

The Old Country work, that is, the work in Great Britain, has not borne the fruit that it was hoped it would. It seems at present that there is such a measure of prosperity in England amongst all classes, and especially among the agriculturists—to whom we devote most of our endeavours in regard to immigration—that they feel they are safer in remaining at home than in coming to a new country and taking chances, even though the chances are good. The result is that the emigration from the British Isles, the last few years, on the total, has shown a steady falling off to all countries until last year, when it took an upward turn, by which we profited.

## COMPARATIVE TOTAL EMIGRATION FROM THE BRITISH ISLES.

I have the figures here to show you by comparison the falling off in this respect. For instance, in 1889, that is ten years ago, the total emigration from the British Isles was 253,795 persons. In 1890 it was 218,000.

*By Mr. LaRivière :*

Q. That is, to all parts of the world ?

A. Yes. In 1891 it was about the same, 218,000 ; in 1892 it was 210,000 ; in 1893, 208,000 ; in 1894, 156,000 ; in 1895, 185,000 ; in 1896, 161,000 ; in 1897, 146,000 ; in 1898, 140,000 ; showing a decrease in the emigration of 1898 as compared with the emigration of 1889 of over 110,000 people.

The proportion to Canada in this connection, however, has not decreased in the same measure. The proportion to Canada in 1889 of the emigration from the British Isles amounted to 28,269 persons, or  $11\frac{1}{2}$  per cent. This seemed to be reduced by 1895 to 9 per cent ; but since then there has been a steady increase—in 1896 to  $9\frac{1}{2}$  per cent, in 1897 to 11 per cent, and in 1898 to  $12\frac{1}{2}$  per cent, showing that although there has been a total decrease in emigration from the British Isles, due to the fact, as mentioned above, that there is such a measure of prosperity at home, the emigration to Canada has not decreased in the same proportion as it has to other countries.

During the present year, while our prospects were better up to a certain date than they had ever been before in regard to British immigration, yet the fact that some countries and some colonies have offered assisted emigration—more especially is this true this year of Queensland, one of the colonies of Australia, which has offered free passages to farmers, farm labourers and domestic servants, all selected—will certainly affect us to some extent this year, but to what extent it is impossible to say.

Now, while all these things had the effect of decreasing emigration from the British Isles, our efforts there have succeeded, at all events in so far that we are losing a less proportion than some other countries. The immigration from the Continent, which up to a very few years ago practically amounted to little or nothing in Canada, is now flocking here in large proportions. At least the prospects are that it will in the very near future. So that we are looking to the most desirable portions of Europe for any large influx of population into Canada. While possibly stronger efforts may tend to help us in Great Britain, especially in England, yet it appears, as I have already intimated, that the prospects from the Old Country are not such as to justify us in expecting any large increase.

*By Mr. Martin :*

Q. Has the increase in immigration been greater or less ?

A. It has been less. There is a decrease of over 110,000 from all countries within the last ten years.

## PROPORTION OF TOTAL IMMIGRATION OF 1898, RECEIVED FROM THE BRITISH ISLES.

*By Mr. LaRivière :*

Q. And what is the proportion from all the British Isles ?

A. I can give you the exact figures from our returns here. Last year there arrived in Canada from Europe,—that is, from the Old Country, the British Isles and the Continent,—21,623 people, who were declared settlers. At the seaport our agent inquires from every passenger who arrives as to his or her destination, and as to whether he or she intends to become a permanent settler in Canada, and that was the number of those who declared themselves to be settlers during 1898. Of this number, 9,475 came from England, 733 were from Ireland, 1,400 from Scotland. The others, making a balance of about 10,000, came from different European countries.

*By Mr. LaRivière :*

Q. Was that in 1898 ?

A. Yes, that was in 1898.

Q. Did you notice, with respect to the decrease, where it is from, whether from England or the Continent ?

A. I will show you. In 1893 the English immigration to Canada was 16,829, showing a decrease of 7,400 between 1893 and 1898.

Q. What part of the British Isles was the decrease from ? Was it from England proper, Ireland or Scotland ?

A. Mostly from England. The Irish immigration decreased also, but not quite in the same proportion, and the Scotch as well. These all show a little decrease from the previous year, but to a very small extent.

*By Mr. Stenson :*

Q. But altogether, for the last ten years, the proportion has been greater ?

A. There has been a general decrease.

Q. But, nevertheless, the proportion is greater in the total immigration ; the difference being from 11 to 12½ per cent ?

A. Yes ; we had about the same number of British immigrants, I think, during the last year as the year before. Our returns show a little increase in the Continental immigration. A number of persons—in fact, a considerable proportion of them—came from Austria, and are known as Galicians, of whom about 5,500 came last year.

*By Mr. LaRivière :*

Q. So there must be a pretty large decrease from the other parts of Europe, when you have a very large increase in the number of Galician immigrants. You say “the amount is about the same, I think, for the year.” So there must be a decrease from the other parts of Europe ?

A. I do not know that that would necessarily follow.

Q. Because there is a large increase in the immigration from Galicia, and the total number from Europe is about the same, I think it would.

A. You mean German, Scandinavian, and other nationalities. German immigration was as 2,660 in 1893, to 563 in 1898, and the Scandinavian was about in the same proportion.

#### EXPENDITURE AND AGENCIES.

We have our expenditure in regard to the Old Country. Last year it was practically the same as the year before last, that is, the Old Country and Continent ; in fact, it was a little less last year than in 1897. In 1897 we spent in salaries \$20,716.92, and in 1898 the expenditure for the same purpose amounted to \$20,576.40 ; that is, for the calendar year, while the immigration shows an increase from 19,304—that is, the total all over the Continent—up to 21,623, being an increase of 2,319.

*By Mr. Stenson :*

Q. You mention the amount of salaries ; have you also the expenditure for expenses ?

A. There are, besides that, the travelling and other expenses of the agents and employees ; the advertising, printing, office rental, &c. These are the only items of expenditure we have in this connection.

*By Mr. Sproule :*

Q. And the travelling expenses of agents ?

A. I have not got those.



*By Mr. LaRivière :*

Q. Your staff is composed of two classes of men—the local agent and the travelling man?

A. In the Old Country, I may say, the system has been adopted of having travelling agents and agents in offices, the agents in the offices giving all the information. We also have an office in the High Commissioner's Office in London, another in Liverpool, one in Glasgow and one in Dublin. At all these offices the agents give information and it is to these that letters are sent asking for information and immigration literature. All the advertisements give the addresses of the agents and, of course, in all the publications we issue, the addresses of these agents are also given, so that any one requiring information may know where to write for it.

*By Mr. LaRivière :*

Q. Then you have a travelling staff as well?

A. They travel and lecture, whenever it is found desirable to do so. I may say the reports of the various agents are contained in the annual report of the Department, showing the actual work they have performed in this respect.

I was going to show our work on the Continent so far as our agents are concerned. We only had agents in France, Belgium and Holland. We have three men altogether in these countries, and we have also made a grant to Prof. Oleskow, who was instrumental in sending out the Galicians.

I may say here, that the people Prof. Oleskow sent out are of the better class—having considerable means of their own—and from inquiries made among those in the west we have found that they have made a success of their farming operations, are becoming possessed of a large stock of farm implements, and are likely to be as good settlers as any we have.

Q. Were they treated on a different basis?

A. No, there is no difference. The only moneys the department has paid out in connection with the Galicians is the sum that was paid to the different continental agents. I may say that we use, on the Continent, steamship booking agents who are also our agents, and for each adult over 18 years of age who is taken through to Manitoba and the North-west Territories they receive a pound sterling. This applies, of course, to all classes of emigrants from the Continent. That is all the money we have paid out in inducing Galician immigration, except the small sum paid to Prof. Oleskow.

Q. Don't you think that brings in unsatisfactory immigrants?

A. We have not changed this matter at all since 1882; it is the same bonus that has been in effect, but I want to add this, that it has been thought well recently to make some changes, especially in regard to Galicians. As they are coming out in such large numbers it was thought better to see how those who have already come out—about 20,000—get on and what class of people they will really turn out to be, before getting any more, and so on the 1st of June next the Galician bonus is to be dropped. We did not wish to be abrupt, so we gave notice of our intention in this regard two months ahead.

*By Mr. Rogers :*

Q. There are 20,000 of them here?

A. Yes.

Q. Since what period?

A. Oh, they have been coming for some years. A few came five or six years ago, but no large number arrived until within the last three years.

*By Mr. LaRivière :*

Q. There are some more on the way now?

A. Yes, we expect 8,000 or 9,000 this year.

*By Mr. Sproule :*

Q. It seems to me that amongst the Galicians there is not the class of immigrants needed, and it might be well to take some steps either to be careful of the men coming in or to check undesirable persons coming in?

A. It is pretty hard to say who are undesirable. From all we can gather, it is those who have come to the country with practically no money who have, in the past two years, put themselves in a good position. They have cleared the land, put up houses, started at once to make their gardens, growing their own vegetables—and many of them have vegetables to sell—and coarse grains; so that it is very difficult to put your hand on those who are undesirable among them and those who are not. Of course, it is always desirable to have people come to the country with means, but past experience has shown that the people who have gone to the west with means have not made the same success as those who have gone in with no means at all.

*By Mr. LaRivière :*

Q. That is a general thing?

A. Yes. We cannot fix a money standard.

Mr. LARIVIÈRE.—It would be only as to the character of the people, because as to their financial standing past experience has shown that people with no money have succeeded, and those who had means failed and then decried the country because they did not get on well.

Mr. DOUGLAS.—The experience in my constituency is that those who borrowed money got into difficulties, while those who began with nothing and laboured as they got opportunity, succeeded better than those who borrowed money and were paying interest; the men who had nothing at all made a success of it.

#### BONUSES.

*By Mr. Moore :*

Q. Does the same apply to the Doukhobors as to the Galicians?

A. Practically the same, excepting this, that the amount we are giving in connection with the Doukhobors—nominally a pound a head—is being paid to them in this country, and is being used for their own benefit since their arrival in the country. Of course, in the case of the Galicians and other European immigrants, the bonus is paid to the European steamship agents and we see nothing more of it; but in the case of the Doukhobors nothing was paid for passage, and the amount of the bonus was paid to a committee in Winnipeg, an independent committee composed of Mr. McCreary, the Commissioner of Immigration at Winnipeg; Mr. McCaffrey, the manager of the Union Bank of Canada there, and Mr. D. W. Bole, as well as Prince Hilkoﬀ, their friend, who is also a trustee for the Doukhobors and will settle with them; and Mr. Archer, who represents the committee in England, which has taken the matter in hand and sent out representatives last fall.

*By Mr. Douglas :*

Q. Is this money paid to the people directly or in supplies?

A. In supplies; there is nothing paid to them directly.

Q. Does the government know that in the past the gravest injury was inflicted on the people, through agents, by giving them supplies instead of money?

A. I do not know.

*By the Minister of Agriculture :*

Q. As I understand it, this money is placed in the hands of trustees who are using it for the benefit of these Doukhobors, of whom one is Prince Hilkoﬀ, their friend, and the other the representative of the English society which has brought about their immigration?

A. That is correct.

Q. That committee in Winnipeg does as it likes with it; you don't know anything about it.

A. We simply deposited it with them.

*By Mr. LaRivière :*

Q. At any rate if there were any complaints, that would be a matter for the department to investigate?

A. Yes.

THE MINISTER OF AGRICULTURE.—This committee is a working committee of friends of the Doukhobors.

*By Mr. Rogers :*

Q. What is the prospect for immigration from Finland?

A. Well, at present it is very hard to make any statement with regard to Finnish immigration. No doubt there is likely to be a large movement of a certain class of Finlanders, and the present intention, I am advised, is that a delegation of representative Finlanders should come to Canada to make an investigation into the resources of the country. If the reports of this delegation are satisfactory it is possible that a large number of these people will settle in this country. But aside from this, no other definite steps have been taken, except to ascertain in a general way what the movement is likely to be.

*By the Chairman :*

Q. Have we any number of Finlanders here now?

A. Yes, a few come out occasionally.

*By Mr. Rogers :*

Q. Are they not very desirable immigrants?

A. Yes, they are spoken of very highly. I had a letter recently from a gentleman who knows them, and he says they are really a most desirable class, and they have a good opinion of Canada, from what they have heard, and if they can make fair arrangements they will come out. There is a danger in speaking of it, however, as the Russian government might prevent their emigration, and whatever is done must be done quietly.

*By Mr. Sproule :*

Q. Will they be good farmers?

A. That will be a very difficult thing to know. Most people who have seen them pronounce them a superior class of people, but whether they will make a success of farming remains to be seen. Of course, they are all agriculturists. I think they will be a most desirable addition to our population.

*By Mr. Clancy :*

Q. You pay a pound a head for all adults?

A. For every person above the age of eighteen who comes from the Continent of Europe.

THRIFTY HABITS OF CONTINENTAL SETTLERS.—COMMISSION DISCONTINUED.

*By Mr. McMillan :*

Q. Is there a regular system of the distribution for that money among the Doukhobors?

A. It is spent in purchasing supplies. I was there last fall and they were discussing the purchase of large quantities of supplies. These people have many tradesmen



among them—blacksmiths, harness-makers, shoemakers ; they make their own clothing ; so the money will be largely spent in raw material. They make their own implements, spades, harrows, &c., and I do not know but what they make their own ploughs. They have made some, and they may prefer making their own ploughs as well, as I have said, as their own boots, shoes and harness.

*By Mr. Moore :*

Q. I understand. Were you proposing to withdraw this vote and continue it to the Doukhobors ?

A. We have simply withdrawn the commission to the booking agents who book Galicians. It will not apply to any other nationality.

Q. That would appear that the Galicians are not so desirable a class of immigrants as the Doukhobors.

A. No, there is no doubt there has been a difference of opinion between a good many people with regard to the Galicians, as to their desirability as immigrants, and as we have a very large number, some 20,000 of them, in this country now, and as these, with what we will have in the course of a month or two, will probably bring the total number up to 25,000, it has been thought that it would be just as well to try it for a year without giving any commission. It is just a question whether the withdrawal of this bonus, or commission, will prevent a very large immigration of these people to this country, as a great many are coming now and we know there are many others who will come later. However, these people are coming, not so much because of the bonus, but largely upon the inducements held out to them by the very satisfactory accounts which their friends who are out here, have sent, of the great progress they themselves have made.

*By Mr. Gilmour :*

Q. Are they being settled together ?

A. No, they are being separated ; there are, may be, ten or twelve colonies of them altogether ; there are no great number of them settled together, except at Edmonton district where the first detachment of them that came in settled. There is a greater number there than in any other district.

*By an hon. Member :*

Q. Where is that ?

A. That is near Fort Edmonton, on the North Saskatchewan. The others are all separated into various colonies.

*By Mr. LaRivière :*

Q. I have the pleasure of having one of those colonies in my own district ?

A. Yes. They have established a school at Fort Saskatchewan.

*By Mr. McMillan :*

Q. Since the commission is withdrawn from the Galicians will they be allowed the same subsidy as the Doukhobors ?

A. No. That will not apply to them at all.

*By Mr. Sproule :*

Q. Do they establish their own schools and teach their own language ?

A. No, they are all anxious to learn the English language. As an indication of how anxious they are to attain this accomplishment, I may mention that I visited some of them last year who had only been about six months in the country and I found that they exhibited a remarkable facility in picking up the English language. Their one aim and desire seems to be to speak the English language and to become Canadians. They

appear to associate the two together, and from all the accounts I hear they promise to acquire Canadian citizenship and the language very rapidly.

Q. How many townships do they occupy?

A. They are not settled in townships, that is, not in solid blocks, but in districts and scattered portions of townships. In the Edmonton district they are, as I have stated, most thickly congregated, but they only take the even sections, so that they are scattered somewhat.

*By Mr. Rogers :*

Q. Do they follow the system of public school instruction in their education?

A. They seem to be interested very much in the education of themselves and their children.

I am just going to quote a few words here from a report by Mr. C. W. Speers, who has been placed in charge of all the colonies of Galicians and visited them to see what progress they were making. He says: "In reviewing the condition of the different colonies that have been established by the Department, as well as those that have been supplemented within the past two years, I think, generally speaking, they are in a very satisfactory condition, and there is every evidence of prosperity and the prospects for the future are very good. The building of churches, the large attendance at the public schools, the desire of these people to acquire the English language, the very significant manner in which they wish to become identified with our citizenship, as well as the great amount of grain and stock being produced by these people, must be a source of gratification to the Department. With the exception of a few in the Edna colony, there will be no demands upon the Department for assistance, and this should be very limited and will be effected in a practical manner, several of the Bukowinians who were detained in quarantine at Halifax and Winnipeg will require a little assistance, but many Galicians in that settlement have as much as from a thousand to twelve hundred bushels of wheat in their granaries, and from two to three hundred bushels of potatoes in their cellars."

*By Mr. Sproule :*

Q. These are Galicians or Doukhobors?

A. This only refers to Galicians. The Doukhobors have only been a few months in Canada and we have no reports at all from them yet, except as to what they were before they came to Canada.

#### SETTLERS FROM THE UNITED STATES

*By Mr. Semple :*

Q. What is the proportion of settlers coming from the United States?

A. Last year our returns show a total of 9,119 persons who arrived from the United States and settled in the country. Of this number about 7,500 settled in Manitoba and the North-west Territories, and the balance in the provinces of Quebec and western Ontario, in the Nipissing and Rainy River districts.

*By Mr. LaRivière :*

Q. From what part of the United States did they come chiefly?

A. Michigan sent the largest number, about 2,500 people.

*By Mr. Douglas :*

Q. How many Mormons have come in?

A. I think there are about 2,000 now in the country.

Q. And more than another thousand coming this spring?

A. Yes. More than that, I think, we expect two or three thousand this spring.

The CHAIRMAN.—I suppose there is no Department responsible for their coming over?

## SETTLEMENT DISTRIBUTION OF CONTINENTAL IMMIGRANTS.

*By Mr. McMillan :*

Q. Have the Doukhobors settled on alternate sections.

A. We made special arrangements for them. They are settled *en bloc*.

Q. Where?

A. Their colonies begin about sixteen miles north of Yorkton. In fact there are two colonies, the larger one being north of Yorkton and the other one on the Swan River reserve, north-west of Dauphin about 200 miles west of Winnipeg.

*By Mr. LaRivière :*

Q. Will they settle in villages in the style of communities?

A. Yes. They are all outside Manitoba in the Territories.

## AGENTS IN THE UNITED STATES.—IMMIGRATION FROM.

*By Mr. Sproule :*

Q. How many agents are there working in the United States now?

A. I think I can give you the names of them a great deal better than I can give you the number. We have McInnes, Caven, Grieve, Broughton, Davies, Bennett, Swanson, Rogers, Crawford, Currie and Holmes, who are paid a regular salary. Then we have three, Messrs. Bartholomew in Iowa, Parker in Duluth, and Ritchie in North Dakota, who are paid a small allowance for expenses, and commission in addition and besides these we have special agents, about 300, in different parts of the States.

Q. You have about 300 sub-agents?

A. Yes.

Q. They are paid by commission?

A. Yes.

Q. What commission?

A. \$3 for every man over eighteen, \$2 for each woman, and \$1 for each child.

*By Mr. LaRivière :*

Q. Why is the difference made between the commission for men and women?

Q. I cannot say why that is. I forgot R. A. Burriss, who is working for the Rainy River district, he is paid the same as Bartholomew, Parker and Ritchie; he is paid an allowance for expenses and his commission.

*By Mr. Sproule :*

Q. You have a man at Detroit?

A. Yes, I mentioned him, Mr. McInnes.

Q. How many persons have these agents sent in?

A. According to our report, 5,500 from these agents.

*By Mr. LaRivière :*

Q. On that list I do not notice the name of a single French Canadian?

A. But we have several whom I should have mentioned. We have had the Rev. Fathers Morin, Brousseau, Blais, Paradis. However, of these, Fathers Brousseau and Paradis are not now employed and have been replaced by Fathers Gouin and Gingras.



*By Mr. Sproule :*

Q. Where are they operating ?

A. In the eastern States.

Q. You say 5,500 people is the result of the work of these agents ?

A. Yes.

Q. How are they paid ; on what principle ?

A. I am only speaking of our regularly appointed agents.

Q. But I asked about your commission agents ?

A. A good number,—in fact a large proportion, of the immigration comes from them. In some cases—well, I cannot give you the exact figures either, so far as these agents are concerned.

Q. You should have a retord ?

A. Well, we have a record of the numbers we pay for, but I cannot give you the figures.

*By Mr. LaRivière :*

Q. Are the details given in your annual report ?

A. No, the full details are never given ; some of them are.

*By Mr. Sproule :*

Q. When do you pay the money ?

A. The agents issue certificates to the railways for passage at approximately one cent a mile in the west and these certificates are returned to us by the Canadian Pacific, and on receipt of them the cheques are issued to the agents.

Q. If that is the way you pay I do not understand it. You have 300 sub-agents and you pay commissions for each immigrant ; how do they get it and on what certificate ?

A. They get it from the Department on receipt of these railway certificates.

Q. Yes, but when ; as soon as the people have landed ?

A. As soon as they strike the Canadian Pacific they present the certificates which are issued to them by the agents, and on presentation of these they get reduced transportation ; that is, for people coming from the United States.

Q. Well, does that go back to the agents ?

A. It comes to the Government.

Q. And that is a voucher for the agent's fee ?

A. Yes.

Q. He can draw his fee any time after that ?

A. Yes, we issue a cheque immediately, as soon as they strike Canada anywhere.

Q. And when they present the certificates from the sub-agents they can get that ?

A. Yes.

Q. Would there not be a chance of making out cheap transportation for others ?

A. Yes, there is that difficulty ; but the Canadian Pacific people are quite alive to their own interests. There have been a few cases where these agents have issued reduced fares to others than actual emigrants.

Q. I have heard of a few cases where that was done ?

A. Yes, there were a few.

*By Mr. LaRivière :*

Q. It is hard to check this little affair, I suppose. No doubt we get the value for the bulk of the commission paid ?

A. Yes.

*By Mr. Sproule :*

Q. All I know is that cases were brought to my attention where that had been done.

A. Yes ; not very many, though.

Q. And these agents not only give their friends the advantage of cheap transportation, but they then collect a commission?

A. Yes, it is possible; but it is very hard to get past the Canadian Pacific Railway. I have known them to hold people as much as two days to make sure they were settlers; much to the inconvenience of the settlers, too. Of course, you must trust your agents, and we have taken care to appoint trustworthy people.

Q. Would you have a record of individual agents, and how much was paid?

A. Yes, we have that. They have not sent in as many as our salaried agents have. It is a side issue with them, being for the most part men who are engaged in other business as well.

*By Mr. LaRivière :*

Q. Have you not had under your consideration a scheme propounded by Father Morin for repatriation?

A. Yes, there is a scheme now before the Department.

Q. Have you decided anything at all on the matter?

A. Nothing as yet.

*By Mr. Moore :*

Q. You would be a little surprised that a larger amount would be given for men than for women? That might be the reason for less women coming from the States?

*By Mr. Taylor :*

Q. Have you any account of the pamphlets you are sending out? Have you copies of the pamphlets here?

A. Yes, I have them all here before the committee.

#### FEMALE AGENTS.—DOMESTIC SERVANTS.

*By Mr. Rogers :*

Q. What result have you from the female agents?

A. That is a burning question in the west. As most of you know, we made an effort to bring out some servants from Scotland, and with that object in view we sent a lady over there and she came back in about three months. We sent her to bring 100, but she only got 59. We advanced the transportation for these people, who agreed to repay us when they were able to do so, and a good deal of the money has been paid back; but from the fact that our agent was only able to get 59 when she was sent to get 100, it is evident that this is a very difficult matter. There has been a suggestion that we should procure them in Sweden, but the emigration laws in Sweden are so stringent that it would be absolutely impossible to send any one there to bring them.

*By the Chairman :*

Q. They would lock them up?

A. Yes.

An Hon. MEMBER.—They should send Pare and Holden there.

The WITNESS.—I may say this, in reference to domestic servants, that it has been found in the west that Galician girls are making splendid servants, and every person who has had them is satisfied. Testimonials have been sent in to the government by ladies who have employed these girls, saying that they are making good servants and are likely to fill that long-felt want, so we hope, in the very near future, we will be able to secure sufficient help from the foreigners. The Doukhobor girls, we expected, would also be willing to go out to service, but they have not so far.

*By Mr. Rogers :*

Q. What proportion of immigrants remain in Ontario ?

A. I cannot tell about the number that remained in Ontario. I can give you the number that remained in eastern Canada. About 15,000 of the foreign immigration coming to Canada went to Manitoba and the North-west. That would leave about 7,500 who remain in eastern Canada.

*By Hon. Mr. Fisher :*

Q. That is, from Europe.

A. Yes, from Europe.

*By Mr. Sproule :*

Q. That is, Quebec and the maritime provinces. That is what you mean by eastern Canada ?

A. No ; Ontario, Quebec, and all the east.

Q. What distinction now do you understand by western Canada ?

A. Western Canada now is all Canada west of Ontario.

Q. And Ontario is included in eastern Canada ?

A. Yes.

*By Mr. Rogers :*

Q. Would any Galicians stay in eastern Canada as servants ?

A. I cannot say as to that.

*By Mr. Semple :*

Q. Is there a record of the number going to British Columbia ?

A. We have no record of those going to British Columbia, but a great many come in from the United States of whom we have no record at all. We have only a record of those who come in on this side of the Rocky Mountains.

*By Mr. LaRivière :*

Q. Are you paying any attention to this exodus that seems to be taking place in the last few weeks to the United States ?

A. Yes.

Q. And that the railway companies are paying bonuses of so much a head for all the agents bring in ?

A. Yes, they have always done that.

Q. Cannot that be stopped ?

A. You cannot stop a railway agent from taking a commission if he can get it, still there is not such a very large emigration from Canada to the States at present.

Q. But there was a rush a few weeks ago, at the re-opening of the factories there.

A. Yes, in the eastern States ; I know that.

*By the Chairman :*

Q. That always happens every year, more or less, does it not ?

A. Yes.

#### IMMIGRATION LITERATURE.

*By Mr. Sproule :*

Q. Have you a record of how much you paid last year for pamphlets, and what pamphlets you got out ?

A. Yes, I have a record of the pamphlets we got out, but I cannot tell the figures. For all printed matter, I presume you mean.



Q. Yes?

A. We got out last year 6,000 copies of the official handbook, 90,000 western Canada pamphlets, 5,000 eastern Canada pamphlets, 20,000 Hints to Settlers, 20,000 German pamphlets on the conditions of western Canada, 30,000 pamphlets containing notes from Wisconsin and Michigan delegates on their visit to the North-west, a Flemish pamphlet, and 18,000 German leaflets. Then we have a Polish pamphlet and a Bohemian pamphlet.

*By Mr. LaRivière :*

Q. Where does the French come in there?

A. French pamphlets were printed in the Old Country by M. Bodard, and by Fathers Morin and Blais on this side. I have not the particulars, but I know they were published.

Q. I think I have seen one.

A. Yes, but more were published in the Old Country.

*By Mr. Sproule :*

Q. Have you any record of the cost of these?

A. All of these were published here, I think, at the Printing Bureau.

Q. All the pamphlets, Doukhobors and all?

A. We didn't get out any Doukhobor pamphlets.

Q. The German pamphlets?

A. Yes. We did publish some outside too. An Austrian pamphlet was published in the United States, but we had to get it printed there. We could not get it printed here at all.

Q. You had an atlas published. Where was that printed?

A. It was printed in Chicago by Rand, McNally & Co.

Q. Have you got a copy of it here?

A. It should be here, I do not know if it is. We sent the papers over some days ago. I do not think there is an atlas here.

*By Mr. LaRivière :*

Q. Have you had any representations with regard to the appointment of an extra man at Winnipeg at the station there?

A. Yes.

Q. Has anything been done yet?

A. No.

*By Mr. Sproule :*

Q. Here is an item in the atlas that attracted my attention that I think should not have been inserted. The item is that the average snowfall is 62 inches. I do not think it is right to put that in any pamphlet.

THE CHAIRMAN.—A good wheat crop follows a heavy snowfall.

MR. SPROULE.—To you or any of us, of course, it would not mean much, but to Old Country people to have that amount of snow stated it seems to me would not likely give a favourable impression.

HON. MR. FISHER.—It goes on to say the railway trains are seldom blocked.

MR. SPROULE.—Yes, but when you say there are so many inches it seems to be a country of beautiful snow.

MR. RUTHERFORD.—As a matter of fact there is a good deal of snow there and it is occasionally cold up in the west.

MR. SPROULE.—I admit that, but as an immigration pamphlet don't you think it would be better to have only the first statement?

THE WITNESS.—I think it is always safe to put both sides of a story in any pamphlet published.

*By Mr. LaRivière :*

Q. There is some ambiguity there ?

A. I understand there might be some misunderstanding that way, as if we had five feet of snow all the time.

Q. By people who do not understand how these measurements are made ?

A. Yes.

Q. I would like to have a list of those agents if they can be easily obtained. All the different agents and how much they are paid ?

A. Do you mean the commission agents and all ?

Q. Yes.

A. I will have a list prepared for you.

Q. And what has been paid to them during the past year ?

A. We have a list. Do you want sub-agents or all agents ?

Q. Sub-agents and all agents ?

#### PROSPECTIVE INCREASE.

*By Mr. LaRivière :*

Q. Everybody connected with that Department, sub-agents and all and how much paid, travelling agents, too ?

A. I may say that so far as this year's immigration is concerned it shows a considerable increase over last year up to this date. I might give you a statement if you think it would be of any interest to know.

Q. Including Galicians and Doukhobors ?

A. Yes.

*By Mr. Sproule :*

Q. What if you leave them out ?

A. Why should we not include them ?

Q. There are particular conditions that have practically driven them out of their country ?

A. Not the Doukhobors. They were sought after by many parts of the United States and South America.

Q. The Galicians had to come to Canada ?

A. No, a much larger number went to South America than to Canada. We only got a small proportion of the Galicians.

Q. As a result of our agents' operations there ?

A. Yes.

Q. That does not agree with what I have seen in the press, that they were obliged to leave their own country and had to go somewhere, and if they went back they would be treated as exiles.

A. I do not think that is true. The Austrian government are very anxious to know just what prospects they have. They sent a consular agent to the west to see. Mr. Schultz, of Montreal, together with Mr. Rotle of the Hamburg Steamship Company, visited the Galicians in the West and reported to the Austrian government.

Q. That may be and still not affect the other statement ?

A. You would hardly think that if they had no interest in them, they would bother to inquire how they were getting on.

Q. The Galicians did not want to take service in their army.

A. The Galicians ! I have never heard of that. The Doukhobors, I believe, objected to military service.

Q. I understand the Galicians object as well, or did not like to take service ?

## TOTAL ARRIVALS AT SEAPORTS.

Mr. SMART.—I will now give the committee the figures of the general immigration, for the following years, showing total arrivals of all classes, at seaports, to the 30th April in each year :—

1895, total up to 30th April .....	4,160
1896     "             " .....	3,776
1897     "             " .....	4,114
1898     "             " .....	5,263
1899     "             " .....	9,810

That shows an increase, for this year, of about 500 over and above the Doukhobors, of whom there are about 4,000. Those are the arrivals at the seaports.

The figures for those who went to the North-west and Manitoba are :—

1895.....	1,376
1896.....	1,486
1897.....	2,210
1898.....	3,402
1899.....	7,745

showing an increase of over 4,000 arrivals in the west, out of total ocean arrivals.

*By Mr. Sproule :*

Q. So your prospects this year are much greater ?

A. Yes.

The above is a correct transcript of my evidence.

JAS. A. SMART,  
*Deputy Minister of Interior.*





# APPENDIX





## RECOMMENDATIONS BY THE COMMITTEE.

The following resolutions were adopted by the Committee as recommendations for the promotion of the agricultural interests of the Dominion :—

## No 1.—TO TAKE DOWN EVIDENCE.

Moved by Mr. Sproule, seconded by Mr. McMillan,—“That the Committee ask authority from the House to employ a shorthand writer to take down such evidence as they may deem proper.”—Adopted.

COMMITTEE ROOM 46,  
25th April, 1899.

## No. 2.—PRINTING THE EVIDENCE OF THE COMMISSIONER OF AGRICULTURE AND DAIRYING.

Moved by Mr. Moore, seconded by Mr. Stenson,—“Resolved that the Committee recommend to the House, that the evidence of the Commissioner of Agriculture and Dairying, submitted to the Committee in the current session, ‘on fattening of chickens,’ ‘on the fundamental principles that underlie the growing of crops,’ and ‘on the Canadian apple trade’ be printed for publication in bulletin form; and that twenty thousand (20,000) copies of each be printed for the use of Members of Parliament and the Department of Agriculture, in the usual numerical proportions of English and French,—five thousand (5,000) copies thereof to be for use of the Department.”—Motion adopted.

COMMITTEE ROOM 46,  
19th May, 1899.

## No. 3.—PRINTING THE EVIDENCE OF THE DIRECTOR OF THE DOMINION EXPERIMENTAL FARMS.

Moved by Mr. Semple, seconded by Mr. McNeill,—“Resolved that the Committee recommend to the House, that the evidence of Dr. Saunders, Director of the Dominion experimental farms, before the Committee in the current session, be printed for publication in bulletin form, to the number of twenty thousand (20,000) copies in the usual numerical proportions of English and French :—Fifteen thousand (15,000) copies thereof to be for distribution to Members of Parliament, and five thousand (5,000) for use of the Department of Agriculture.”—Motion adopted.

COMMITTEE ROOM 46,  
13th June, 1899.

No. 4.—TO PRINT THE EVIDENCE OF THE SEVERAL OFFICERS AT THE CENTRAL EXPERIMENTAL FARM, NOT INCLUDING THAT OF THE DIRECTOR.

Moved by Mr. Henderson, seconded by Mr. McGregor,—“Resolved that the Committee report, asking the House to authorize the printing of twenty thousand (20,000) copies of each of the evidence of A. W. Gridale and that of the several members of the central experimental farm staff, taken before the Committee since the 6th June, current.”—Motion adopted.

COMMITTEE ROOM 46,  
28th June, 1899.

No. 5.—COMPLIMENTARY VOTE TO THE CHAIRMAN, BEFORE ADJOURNMENT TO MAKE FINAL REPORT.

Moved by Mr. Sproule, seconded by Mr. Cochrane,—“That this Committee have much pleasure in now tendering their thanks to Mr. Bain, for the uniform courtesy, fairness and ability with which he has presided over the investigations and general business of the Committee during the current and past sessions of Parliament in which he has filled the position of Chairman.”

The motion was put by Mr. McMillan in the Chair, upon which the Members unanimously rose to their feet and adopted the motion with applause.

COMMITTEE ROOM 46,  
1st August, 1899.

The preceding resolutions are true copies as recorded in the minutes of meetings of the Select Standing Committee on Agriculture and Colonization, on the respective dates specified.

J. H. MACLEOD,  
*Clerk to Committee.*

## INTERIM REPORTS.

## FIRST REPORT.

The Select Standing Committee on Agriculture and Colonization, present their First Report of the said Committee, as follows :—

The Committee recommend that the House grant them authority to employ a shorthand writer to take down such evidence as they may deem proper.

THOS. BAIN,  
*Chairman.*

HOUSE OF COMMONS,  
25th April, 1899.

*Concurred in by the House, 25th April.*

## SECOND REPORT.

The Select Standing Committee on Agriculture and Colonization, present their Second Report, as follows :—

The Committee recommend that the House authorize the printing in the usual numerical proportions of English and French, in the form of advanced sheets of the Committee's Final Report, twenty thousand (20,000) copies of each of the following divisions of the evidence given before the Committee in the current session of Parliament, on the specific subjects of,—“The fattening of chickens ;” “The fundamental principles that underlie the growing of crops ;” “The Canadian apple trade,” and “The making of butter ;” and that fifteen thousand (15,000) copies of each of the said advanced sheets be for use of Members of Parliament, and five thousand (5,000) of each for the use of the Department of Agriculture.

THOS. BAIN,  
*Chairman.*

HOUSE OF COMMONS,  
19th May, 1899.

*Concurred in by the House 19th May.*

## THIRD REPORT.

The Select Standing Committee on Agriculture and Colonization, present their Third Report, as follows :—

The Committee recommend that the House authorize the printing forthwith, in the usual numerical proportions of English and French, in the form of advanced sheets of the Committee's Final Report, twenty thousand (20,000) copies of the evidence of the Director of the Dominion Experimental Farms before the Committee in the current



session of Parliament ; fifteen thousand (15,000) copies thereof to be for distribution to Members of Parliament, and five thousand (5,000) allotted to the Department of Agriculture.

THOS. BAIN,  
*Chairman.*

HOUSE OF COMMONS,  
14th June, 1899.

*Concurred in by the House, 15th June.*

FOURTH REPORT.

The Select Standing Committee on Agriculture and Colonization, present their Fourth Report, as follows :—

The Committee recommend that the House authorize the printing forthwith, in the usual numerical proportions of English and French, in the form of advanced sheets of the Committee's Final Report, twenty thousand (20,000) copies of the evidence of each of the Officers at the Central Experimental Farm, who gave evidence before the Committee on the 6th June current, and from the 15th to the 28th June. Six hundred (600) copies of his own evidence to be allotted to each witness and the balance to be distributed to Members of Parliament.

THOS. BAIN,  
*Chairman.*

HOUSE OF COMMONS,  
30th June, 1899.

*Concurred in by the House, 30th June.*



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